FILE

SALT RIVER PROJECT
POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-8695

Richard M. Hayslip
MANAGER
Environmental Service

September 29, 1993

Latha Rajagopalan
Hazardous Waste Management Division
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Re: Fourth Quarterly Groundwater Monitoring Report
Navajo Generating Station (RCRA 009-90-001)

Dear Ms. Rajagopalan:

Pursuant to requirements specified in the Modifications to the Consent Agreement and Final Order (Modified CA/FO) executed on August 14, 1992, attached is the fourth quarterly monitoring report of the investigation of hexavalent chromium contamination in shallow and deep monitor wells at the Navajo Generating Station. The report documents the results of hexavalent chromium analyses of groundwater samples collected on August 17, 1993.

The results of the sampling indicate no detectable concentration of hexavalent chromium is observed in the three existing deep wells. As was the case in the third round of sampling, the analytical laboratory reported the hexavalent chromium concentration to a method detection limit (MDL) of 0.005 mg/l. In the shallow monitor wells, the fourth quarter monitoring data indicate hexavalent chromium is detected in monitor well #71 at a concentration of 0.87 mg/l. Monitor well #71 has consistently shown sub part per million levels of hexavalent chromium in the previous monitoring periods. Hexavalent chromium was also reported in groundwater from monitor well #63 at a concentration of 0.005 mg/l, the laboratory method detection limit.

With the submittal of this report, SRP has completed quarterly sampling and analysis of NGS shallow and deep monitor wells for hexavalent chromium for a one year period as required by the Modified CA/FO. The results of the quarterly monitoring obtained from the three existing deep wells at NGS have demonstrated that there is no detectable hexavalent chromium in groundwater. Moreover, in the third and fourth rounds of sampling the method detection limit for hexavalent chromium was 0.005 mg/l, one order of magnitude lower than the 0.050 mg/l MDL reported in the first two sampling rounds. Thus, the recent monitoring results provide even greater assurance that there has been no contamination of the regional aquifer underlying the NGS site.

With respect to the shallow monitor wells, the results of quarterly monitoring have confirmed

that hexavalent chromium contamination is limited to monitor well #71. Monitor well #71 was the only shallow well that was found to have detectable hexavalent chromium in the initial NGS Soil and Groundwater Investigation for Determining Potential Chromium Contamination as documented in the Final Report submitted to the EPA in October 1991. In that investigation, monitor well #71 was observed to have had 1.2 mg/l hexavalent chromium. In the monitoring conducted over the past year, monitor well #71 has had 0.98 mg/l, 0.10 mg/l, 0.049 mg/l, and 0.87 mg/l hexavalent chromium reported in the four successive sample rounds. There was no hexavalent chromium detected in any of the other shallow monitor wells above a concentration of 0.050 mg/l in the first and second quarterly reports. In the last two sampling rounds, there is no evidence of hexavalent chromium in any of the shallow monitor wells, aside from monitor well #71, above the 0.005 mg/l MDL.

On the basis of these findings that demonstrate all shallow and deep monitor wells, other than monitor well #71, are below the EPA recommended chromium exposure level of 0.1 mg/l and pursuant to sections 2(b) and 3(b) of the Modified CA/FO, Salt River Project has met the relevant and appropriate closure performance standards in 40 C.F.R. 265.111 and no further sampling or other action will be required with respect to shallow and deep groundwater. Salt River Project requests that the EPA provide written verification of satisfactory completion of all tasks required by the CA/FO and closure of Docket Number RCRA 009-90-0001.

Please call Dennis Shirley, of my staff, at (602) 236-2685 if you have any questions.

Sincerely,

Richard M. Hayslip, Manager
Environmental Services Department

DHS:RMH/dg
Attachments

cc: Sadie Hoskie, Navajo Environmental Protection Administration

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Company: U.S. EPA, Region [illegible]
Department/Floor No.: H/W MgmtlDi
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Investigation For Hexavalent Chromium Contamination in Shallow and Deep Monitor Wells

Overview:

On August 17, 1993, field technicians from SRP Environmental Services Department collected samples from three deep wells and nine shallow monitor wells at the Navajo Generating Station (NGS). The samples were transferred to Westech Laboratories, Incorporated of Phoenix, Arizona and analyzed for hexavalent chromium.

Summary of Deep Groundwater Monitoring Activities:

Field and laboratory procedures for monitoring the deep groundwater monitor wells were specified in a Sampling and Analysis Plan (SAP) that was submitted to EPA Region IX on September 14, 1992, as an amendment to the May 1991 "Sampling and Analysis Plan for Determining Potential Chromium Contamination at the Navajo Generating Station". EPA approval of the SAP was documented in a letter dated November 17, 1992. The locations of the deep wells are shown in Figure 1.

Prior to sampling, measurements of the depth to groundwater were taken in each well. The measured groundwater elevations relative to a Mean Sea Level (MSL) datum are as follows:

Well ID	*Elevation (feet above MSL)*	*Measuring Point Depth to Water (feet)*	*Groundwater Elevation (feet above MSL)*
DW #1	4,298.0	901.4	3,396.6
DW #2	4,366.2	948.7	3,417.5
DW #3	4,424.1	976.6	3,447.5

Groundwater samples were collected from deep wells #1 and #3 following well purging with the dedicated pumps in the well. A groundwater sample was collected from deep well #2 using a two inch stainless steel bailer lowered to below static water level via wireline. Field records of deep well groundwater sampling are provided in Attachment 1.

The groundwater samples were submitted to Westech Laboratories Incorporated of Phoenix, Arizona for hexavalent chromium analysis. The results of the laboratory analysis are shown below and indicate there is no detectable concentration of hexavalent chromium in any of the deep well samples. Of particular significance in this report, Westech Laboratories reported the hexavalent chromium concentration to a method detection limit (MDL) of 0.005 mg/l rather than the MDL of 0.050 mg/l that was reported in the first two quarterly reports.

Well ID	*Sample ID*	*Location*	*Hexavalent Chromium*
DW #1	NGS-DW-1	north plant site	> 0.005 mg/l
DW #2	NGS-DW-2	railroad loop at plant site	< 0.005
DW #3	NGS-DW-3	ash disposal area	< 0.005

Laboratory certificates of analysis and chain of custody records for the deep well sample analyses are provided in Attachment 2.

Summary of Shallow Groundwater Monitoring Activities:

Field and laboratory procedures for monitoring the shallow groundwater monitor wells were stated in the "Sampling and Analysis Plan for Determining Potential Chromium Contamination at the Navajo Generating Station" (SAP) submitted to the EPA in May 1991. EPA approval of the SAP was documented in a letter dated July 17, 1991. In further refinement of sampling procedures, SRP and EPA agreed that samples would be collected from the shallow wells as soon as sufficient water had entered the well following well purging. This provision was included in the EPA letter dated November 17, 1992. Figure 2 shows the locations of the shallow monitor wells that were sampled.

Groundwater samples were collected on August 17, 1993, from all shallow wells designated for monitoring. Prior to sampling, the wells were purged by removing three well casing volumes of water or bailed dry where there was insufficient water to purge. Samples of groundwater were collected when a sufficient volume of water had entered the well. The amount of time required to yield the 250 milliliter sample volume ranged from a few minutes to approximately twelve hours. Field records of groundwater sampling in the shallow wells are provided in Attachment 3.

The groundwater samples were submitted to Westech Laboratories for hexavalent chromium analysis. The results of the laboratory analysis are shown in the following table. Monitor well #71, which has shown hexavalent chromium concentrations ranging from 0.049 to 0.98 mg/l in the previous three rounds of groundwater monitoring, exhibited a concentration of 0.87 mg/l hexavalent chromium. Monitor well #63, which has never been observed to have any detectable concentrations of hexavalent chromium, was reported to have 0.005 mg/l hexavalent chromium in this round. It should be noted that 0.005 mg/l is the Westech Laboratories method detection limit for the procedure. Laboratory certificates of analysis and chain of custody records for the shallow well sample analyses are provided in Attachment 4.

Results of Hexavalent Chromium Analyses of Shallow Ground Water Monitor Well Samples Collected on August 17, 1993					
Well ID	*Sample ID*	*Approx. Plant Coordinates*		*Screened Interval (feet bgs)*	*Hexavalent Chromium (mg/l)*
		North	*East*		
A	GSMWNS-A	N6704	E4807	10-30	< 0.005
B	GSMWNS-B	N6697	E4506	5-25	< 0.005
C	GSMWNS-C	N7067	E4319	7.5-17.5	< 0.005
D	GSMWNS-D	N7007	E4044	9-19	< 0.005
E	GSMWNS-E	N7431	E4018	6.5-16.5	< 0.005
31	GSMWNS-31	N6990	E4960	0-33	< 0.005
63	GSMWNS-63	N7983	E4028	3-21	0.005
66	GSMWNS-66	N6400	E6050	17-28	< 0.005
71	GSMWNS-71	N6480	E5070	16-22	0.87

Quality Assurance/Quality Control:

SRP followed the protocol documented in the SAP for quality assurance/quality control (QA/QC) of the sample collection and handling. The protocol includes measures for decontaminating sampling equipment, purging the well, obtaining well and quality control samples, documenting the samples and sampling procedure, and transferring the samples to the analytical laboratory.

Two samples were collected during the August 17, 1993, sampling event for quality control purposes including a monitor well duplicate and an equipment blank. Documentation of the quality control samples is provided in the groundwater monitoring field data reports in Attachment 3. The duplicate sample was collected from NGS monitor well #71 and designated as NGMWNS-F. The primary and duplicate sample from monitor well #71 were both reported to have a concentration of 0.870 mg/l hexavalent chromium. The equipment blank sample represents a sample of the rinse water from the decontamination of the submersible pump used to purge shallow monitor wells. The equipment blank sample, designated GSMWNS-EB, was collected once the pump was decontaminated after purging monitor well #71. The equipment blank did not have any detectable hexavalent chromium.

All samples collected on August 17, 1993, were submitted and analyzed by Westech Laboratories within the 24 hour holding time limit for hexavalent chromium. Westech Laboratories performed quality control testing during the analysis of the NGS water samples

as specified in their quality assurance manual. The quality control program included analysis of laboratory spike, duplicate, blank, and control samples.

Laboratory certificates of analysis and chain of custody records for the quality control sample analyses are provided in Attachment 5. Also provided in this attachment are the results of the Westech Laboratories quality control testing for the set of samples.

Attachment 1

Figure 5

Groundwater Monitoring Field Data

Site NGS - DW-1 Date 8/17/93

Casing Diameter 6.75" Casing Depth 1200' Pump Setting 945'

Purging Data Taken 8/16/93 ← 1330 HRS

SWL 401.4 Feet Of Water In Well 298.6 Gal. Water/Ft 1.859

1x Well Vol 555 2x Well Vol 1110 3x Well Vol 1665 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading 9999680 Start Time 0450

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH	7.01	10.03	pH	1000	

	Meterread	EC	pH	To	Q (GPM)	Remarks
Start	9999680	186	9.4	18.8	8.6	H_2O CLEAR
1x Vol	0000235	231	8.5	21.9	9.1	" "
2x Vol	0000790	415	8.3	22.0	9.1	VERY SLIGHT PINKISH TINT
3x Vol	0001345	432	8.3	22.4	9.0	" " " "
4x Vol						
5x Vol						

Ending Flowmeter Reading 1370 Gallons Pumped 1690 Sample Time 0755

Additional Comments:

PURGED WELL W/ DEDICATED PUMP SAMPLED W/ SAME

Sampled by:

R. TRIGGS / J. LEE WATTS

Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site NGS - DW - 2 Date 5/17/93

Casing Diameter 4" → 660' / 6.75" → 1500' Casing Depth 1500' Pump Setting No Pump in Well

Purging Data

SWL 948.7 Feet Of Water In Well 551.3' Gal. Water/Ft 1.859

1x Well Vol _____ 2x Well Vol _____ 3x Well Vol _____ 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time 1115

Additional Comments:

Well was not Purged Sampled w/ Stainless Steel Bailer @ ≈ 10' Below SWL

- MP is Top of 4" Casing

Sampled by:

R. Riggs / J. Lee Watts

Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site NGS-DW-3 Date 8/17/93

Casing Diameter 6.75" Casing Depth 1500' Pump Setting 1029'

Purging Data — TAKEN 8/16/93 1540 HRS

SWL 976.6 Feet Of Water In Well 523.4 Gal. Water/Ft 1.859

1x Well Vol 973 2x Well Vol 1946 3x Well Vol 2919 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading 1370 Start Time 0900

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH	7.01	10.03	pH	1000	

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start	1370	248	9.3	24.0	9.5	H_2O Clear
1x Vol	2343	238	8.4	22.9	9.3	" "
2x Vol	3316	212	8.4	23.1	9.5	" "
3x Vol	4289	238	8.4	23.3	9.4	" "
4x Vol						
5x Vol						

Ending Flowmeter Reading 4290 Gallons Pumped 2920 Sample Time 1415

Additional Comments:

Purged Well w/ Dedicated Pump. Sampled w/ Same

Sampled by:

R. Tricou / J. Lee Watts

Print Signature

Signature

Attachment 2

Westech Laboratories Inc.
The Quality People
Since 1955

Phoenix • 3737 E. Broadway Rd. • AZ 85040 • 602-437-1080 • fax 437-8706
Flagstaff • 2400 E. Huntington Dr. • AZ 86004 • 602-774-2312 • fax 774-6469
El Paso • 10737 Gateway West #100 • TX 79935 • 915-592-3591 • fax 592-3594

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TELEPHONE: 236-4130
PROJECT: NGS
JOB/P.O. NO.:

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

SAMPLER (SIGNATURE): [signature] / [signature]
SAMPLER (PLEASE PRINT): R. TRIGGLE / J. LEE WATTS

SAMPLE TYPE CODES: S - SOIL, O - OIL, T - TRAVEL BLANK, W - WATER, G - SLUDGE, F - FIELD BLANK, X - OTHER (SPECIFY)

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE LOCATION	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	HOLD	REQUESTED ANALYSES: Hex CHRomium	COMMENTS	LABORATORY IDENTIFICATION
NGS-DW-1	8/17/93	0755			✓	W	1		✓		9317471
GSMWNS-63		0620			✓	W	1		✓		7472
GSMWNS-66		0725			✓	W	1		✓		7473
GSMWNS-D		0810			✓	W	1		✓		7474
GSMWNS-E		0815			✓	W	1		✓		7475
GSMWNS-C		0820			✓	W	1		✓		7476
GSMWNS-EB		0840			✓	W	1		✓		7477
NGS-DW-2		1115			✓	W	1		✓		7478
GSMWNS-71		1330			✓	W	1		✓		7479
GSMWNS-A		1345			✓	W	1		✓		7480
GSMWNS-31		1355			✓	W	1		✓		7481
NGS-DW-3		1415			✓	W	1		✓		7482
GSMWNS-F		1430			✓	W	1		✓		7483
GSMWNS-B	↓	1455			✓	W	1		✓		7484

RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE/TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
[signature]	R. TRIGGLE	8/17/93 1525 hrs.	[signature]	SKYWEST
SkyWest	[initials]	8-17-93 1830	Mike English	[initials]

REMARKS

SAMPLE / COOLER °C

SAMPLE PROCESS TURNAROUND TIME: ☐ 10 BUSINESS DAYS ☐ OTHER (SPECIFY)

Westech Laboratories Inc.
The Quality People
Since 1955

4625 East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8506

CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317471
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: ABN
PAGE : 1 OF 1

CLIENT SAMPLE ID : NGS-DW-1
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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WATER & WASTE DIVISION
Environmental Services

(1) Copy to Client

Managing Director

Westech Laboratories Inc.
The Quality People
Since 1955

3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8706

CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317478
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : NGS-DW-2
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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Managing Director

Westech Laboratories Inc.
The Quality People
Since 1955

[illegible] East Broadway Road
Phoenix, Arizona 85040
(602) 437-0080 • fax 437-0750

CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317482
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : NGS-DW-3
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

(1) Copy to Client

Managing Director

Attachment 3

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-A Date 5/17/93

Casing Diameter 2" Casing Depth 32.13' Pump Setting Bailed Dry

Purging Data

SWL 23.67' Feet Of Water In Well 8.46' Gal. Water/Ft 0.163

1x Well Vol _____ 2x Well Vol _____ 3x Well Vol _____ 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time 1345

Additional Comments:

Evacuated w/ Disposable Bailer @1325 hrs. Let sit for ≈ 20 min.
Sampled w/ same Bailer @ 1345 hrs

Sampled by:

R Riddle / J. Lee Watts
Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-B Date 8/17/93

Casing Diameter 2" Casing Depth 27.20' Pump Setting Bailed Dry

Purging Data

SWL 19.60' Feet Of Water In Well 7.60' Gal. Water/Ft 0.163

1x Well Vol _____ 2x Well Vol _____ 3x Well Vol _____ 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterreod	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time 1455

Additional Comments:

Evacuated Well w/ Disposable Bailer @ 1300 HRS 8/17/93 Let Recover For 120 mins Sampled w/ Same Bailer @ 1455 HRS

Sampled by:

R. Riggle / J. Lee Watts

Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-C Date 8/17/93

Casing Diameter 2" Casing Depth 19.59' Pump Setting Bailed Dry

Purging Data

SWL 11.31 Feet Of Water In Well 8.28 Gal. Water/Ft 0.163

1x Well Vol 1.3 2x Well Vol 2.6 3x Well Vol 3.9 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time 0820

Additional Comments:

(Evacuated) Well w/ Disposable Bailer on 8/16/93 @1620 HRS Let Recover Overnight.

Sampled w/ Same Bailer @ 0820 HRS 8/17/93

Sampled by:

R. Trigg / J. Lee Watts

Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS - D Date 8/17/93

Casing Diameter 2" Casing Depth 21.41' Pump Setting Bailed Dry

Purging Data

SWL 13.97 Feet Of Water in Well 7.44 Gal. Water/Ft 0.163

1x Well Vol 1.2 2x Well Vol 2.4 3x Well Vol 3.6 4x Well Vol ______ 5x Well Vol ______

Beginning Flowmeter Reading ______ Start Time ______

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading ______ Gallons Pumped ______ Sample Time 0810

Additional Comments:

Evacuated Well w/ Disposable Bailer on 8/16/93 @ 1540 hrs Let Recover overnight.

Sampled w/ San. Bailer @ 0810 hrs 8/17/93

Sampled by:

R Price / J. Lee Watts

Print Signature

[signatures]

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-E Date 8/17/93

Casing Diameter 2" Casing Depth 18.63 Pump Setting BAILED DRY

Purging Data

SWL 13.00 Feet Of Water In Well 5.63 Gal. Water/Ft 0.163

1x Well Vol 0.92 2x Well Vol 1.84 3x Well Vol 2.76 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time 0815

Additional Comments:

EVACUATED WELL W/ DISPOSABLE BAILER ON 8/16/93 @ 1600 HRS LET RECOVER OVERNIGHT

SAMPLED W/ SAME BAILER @ 0815 HRS 8/17/93

Sampled by:

R PRINCE / J. LEE WATTS
Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-31 Date 5/17/93

Casing Diameter 2" Casing Depth 30.43 Pump Setting Bailed Dry

Purging Data

SWL 15.55 Feet Of Water In Well 14.88 Gal. Water/Ft 0.163

1x Well Vol _____ 2x Well Vol _____ 3x Well Vol _____ 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time 1355

Additional Comments:

Evacuated well with 2" stainless steel bailer @ 1330 hrs let sit for 25 mins. & sampled w/ disposable bailer @ 1355 hrs

Sampled by:

R. Pringle / J. Lee Watts

Print Signature

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-63 Date 8/17/93

Casing Diameter 4" Casing Depth 23.27' Pump Setting 23'

Purging Data

SWI 8.37 Feet Of Water In Well 14.90 Gal. Water/Ft 0.653

1x Well Vol 9.7 2x Well Vol 19.4 3x Well Vol 29.1 4x Well Vol ____ 5x Well Vol ____

Beginning Flowmeter Reading ____ Start Time 0605

Instrument Calibration

Std	7.0	10.0
pH	7.01	10.03

Std	1000	10,000
pH	1000	

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start	0 Gal.	34	8.1	25.6	~5	H2O Clear (Suspect Residual DI H2O)
1x Vol	10 Gals	1,560	7.1	21.3	~5	" Stained
2x Vol	20 Gals	1,890	7.1	20.4	~5	" "
3x Vol	30 Gals.					
4x Vol						Pumped Dry After 20 Gals
5x Vol						(0610 HR.)

Ending Flowmeter Reading — Gallons Pumped 20 Sample Time 0620

Additional Comments:

Evacuated Well w/ Redi-Flo 2 Env Pump Let Recover 5 mins + Sampled w/ Disposable Bailer

Volumes measured w/ 5 Gal Bucket

Pump Decontaminated w/ Liquinox + DI H2O From X-City Lab

Sampled by:

R. Trickle / J. Lee Watts

Print Signature

[signature]

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-66 Date 8/17/93

Casing Diameter 4" Casing Depth 30.08' Pump Setting 30'

Purging Data

SWI 15.03 Feet Of Water in Well 15.05 Gal. Water/Ft 0.653

1x Well Vol 10 2x Well Vol 20 3x Well Vol 30 4x Well Vol ____ 5x Well Vol ____

Beginning Flowmeter Reading — Start Time 0712

Instrument Calibration

Std	7.0	10.0
pH	7.01	10.03

Std	1000	10,000
pH	1000	

	Meterread	EC	pH	T°	Q (GPM)	Remarks
Start	0 Gals	10510	7.5	23.5	~4	H2O Pinkish
1x Vol	10 Gals	10490	7.4	23.4	~4	" Clear
2x Vol	20 Gals	10530	7.4	23.4	~4	" "
3x Vol	30 Gals	10,570	7.4	23.4	~4	" "
4x Vol						
5x Vol						

Ending Flowmeter Reading — Gallons Pumped 35 Sample Time 0725

Additional Comments:

Purged Well w/ Redi-Flo 2 Env Pump. Volumes measured w/ 5 Gal Bucket

Sampled w/ Disposable Bailer.

Decontaminated Pump w/ Liquinox + DI H2O From Yount Lab

Sampled by:

R Price / J. Lee Watts

Print Signature

[signature]

Signature

Figure 5

Groundwater Monitoring Field Data

Site GSMWNS-71 Date 8/17/93

Casing Diameter 4" Casing Depth 24.82' Pump Setting 24'

Purging Data

SWL 16.97 Feet Of Water In Well 7.85 Gal. Water/Ft 0.653

1x Well Vol 6 2x Well Vol 12 3x Well Vol 18 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time 0830

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH	7.01	10.03	pH	1000	

	Meterread	EC ?	pH	T°	Q (GPM)	Remarks
Start	0 Gals	~~2580~~	7.8	25.8	~3	H_2O Clear
1x Vol	6 Gals	6990	7.7	23.5	~3	" "
2x Vol	12 Gals					
3x Vol	18 Gals					Pumped Dry after 10-11 Gals. 0833
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped 11 Sample Time 1330

Additional Comments:

Purged Well w/ Redi-Flo 2 Env. Pump. Volumes measured w/ 5 Gal Bucket
Let Recover Till 1330 Hrs. Sampled w/ Disposable Bailer @ 1330 Hrs
Decontaminated pump w/ Liquinox + DI H_2O from XCT Lab
Duplicate Sample Taken at This Site: GSMWNS-F (Duplicate of 1430 Sample)
Took Equipment Blank out of Cleaned Pump GSMWNS-EB 0840 Hrs.

Sampled by:

R. Riggle / J. Lee Matts

Print Signature

Signature

Attachment 4

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Phoenix • 3737 E. Broadway Rd. • AZ 85040 • 602 437-1080 • fax 437-8706
Flagstaff • 2400 E. Huntington Dr. • AZ 86004 • 602 774-2312 • fax 774-6469
El Paso • 10737 Gateway West #100 • TX 79935 • 915 592-3591 • fax 592-3594

CHAIN OF CUSTODY RECORD

RECEIVED
AUG 26 1993
WATER & WASTE DIVISION
Environmental Services

CLIENT	ADDRESS	
SRP	PO Box 52025	
	PHX AZ 85072	
TELEPHONE	PROJECT	JOB/P.O. NO.
236-4130	NGS	

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

SAMPLER (SIGNATURE): R. Briggs, J. Lee Watts
SAMPLER (PLEASE PRINT): R. BRIGGS, J. LEE WATTS

SAMPLE TYPE CODES: S - Soil; O - Oil; T - Travel Blank; W - Water; G - Sludge; F - Field Blank; X - Other (specify)

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE LOCATION	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	HOLD	REQUESTED ANALYSES: Hex Chromium	COMMENTS	LABORATORY IDENTIFICATION
NGS-DW-1	8/11/93	0755			✓	W	1		✓		9317471
GSMWNS-63		0620			✓	W	1		✓		7472
GSMWNS-66		0725			✓	W	1		✓		7473
GSMWNS-D		0810			✓	W	1		✓		7474
GSMWNS-E		0815			✓	W	1		✓		7475
GSMWNS-C		0820			✓	W	1		✓		7476
GSMWNS-ED		0810			✓	W	1		✓		7477
NGS-DW-2		1115			✓	W	1		✓		7478
GSMWNS-71		1330			✓	W	1		✓		7479
GSMWNS-A		1345			✓	W	1		✓		7480
GSMWNS-31		1355			✓	W	1		✓		7481
NGS-DW-3		1415			✓	W	1		✓		7482
GSMWNS-F		1430			✓	W	1		✓		7483
GSMWNS-B	V	1455			✓	W	1		✓		7484

RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE / TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
R. Briggs	R. BRIGGS	8/11/93 1525hrs	[illegible]	SKY WEST
SkyWest	[illegible]	1535 8/11/93	Mike England	[illegible]
RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE / TIME	RECEIVED BY (SIGNATURE)	PRINT NAME

REMARKS

SAMPLE / COOLER °C

SAMPLE PROCESS TURNAROUND TIME: ☐ 10 BUSINESS DAYS
☐ OTHER (SPECIFY)

623 (6/93) White - Testing Laboratory; Yellow - Department Job File; Pink - Client

Westech Laboratories Inc.
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1717 East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-0851

CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317480
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-A
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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Phoenix, Arizona 85040
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CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317484
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGW
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-B
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317476
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-C
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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4625 East Broadway Road
Phoenix, Arizona 85040
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CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317474
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-D
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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Phoenix, Arizona [illegible]
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CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317475
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AEH
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-E
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317481
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-31
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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PHOENIX, AZ 85072

SAMPLE NO. : 9317472
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: ABN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-63
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	0.005	mg/L	0.005	08-18-93

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ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317473
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGH
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-66
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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CLIENT SALT RIVER PROJECT
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ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317479
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: GEN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-71
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	0.87	mg/L	0.005	08-18-93

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Attachment 5

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El Paso • 10737 Gateway West #100 • TX 79935 • 915-592-3591 • fax 592-3594

CHAIN OF CUSTODY RECORD

RECEIVED
AUG 26 1993
WATER & WASTE DIVISION
Environmental Services

CLIENT	ADDRESS	
SRP	PO Box 52025 PHx Az 85072	
TELEPHONE 236-4130	PROJECT NGS	JOB/P.O. NO.

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

SAMPLER (SIGNATURE): [signature] IV, [signature]
SAMPLER (PLEASE PRINT): R. Riggs, J. Lee Watts

SAMPLE TYPE CODES: S - SOIL, O - OIL, T - TRAVEL BLANK, W - WATER, G - SLUDGE, F - FIELD BLANK, X - OTHER (SPECIFY)

REQUESTED ANALYSES: Hex Chromium

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE LOCATION	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	HOLD	Hex Chromium	COMMENTS	LABORATORY IDENTIFICATION
NGS-DW-1	8/11/93	0755			✓	W	1		✓		9317471
GSMWNS-63		0620			✓	W	1		✓		7472
GSMWNS-66		0725			✓	W	1		✓		7473
GSMWNS-D		0810			✓	W	1		✓		7474
GSMWNS-E		0815			✓	W	1		✓		7475
GSMWNS-C		0820			✓	W	1		✓		7476
GSMWNS-EB		0910			✓	W	1		✓		7477
NGS-DW-2		1115			✓	W	1		✓		7478
GSMWNS-71		1330			✓	W	1		✓		7479
GSMWNS-A		1345			✓	W	1		✓		7480
GSMWNS-31		1355			✓	W	1		✓		7481
NGS-DW-3		1415			✓	W	1		✓		7482
GSMWNS-F		1430			✓	W	1		✓		7483
GSMWNS-B	↓	1455			✓	W	1		✓		7484

RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE/TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
[signature] IV	R. Riggs	8/11/93 1525	[signature]	SkyWest
SkyWest	[signature]	8-11-93	Mike English	[signature]

REMARKS

SAMPLE / COOLER °C

SAMPLE PROCESS TURNAROUND TIME: ☐ 10 BUSINESS DAYS ☐ OTHER (SPECIFY)

623-1629.0 White - Testing Laboratory; Yellow - Department Job File; Pink - Client

Westech Laboratories Inc.
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3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-0080 • FAX 437-0030

CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317483
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-F
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	0.87	mg/L	0.005	08-18-93

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Managing Director

Westech Laboratories Inc.
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[illegible] East Bourdeaux Road
Phoenix, Arizona [illegible]
(602) 437-1088 • fax 437-[illegible]

CLIENT SALT RIVER PROJECT
WATER QUALITY & GEOHYDROLOGY
ATTN: DON WHITMER
P.O. BOX 52025
PHOENIX, AZ 85072

SAMPLE NO. : 9317477
INVOICE NO.: 22132841
REPORT DATE: 08-19-93
REVIEWED BY: AEN
PAGE : 1 OF 1

CLIENT SAMPLE ID : GSMWNS-EB
SAMPLE TYPE .....: WATER
SAMPLED BY .....: R. PRIGGE/J. WATTS
SUBMITTED BY ....: R. PRIGGE
SAMPLE SOURCE ...: --

AUTHORIZED BY : D. WHITMER
CLIENT P.O. : #VV10117CDJA
SAMPLE DATE ...: 08-17-93
SUBMITTAL DATE : 08-18-93
EXTRACTION DATE: --

Inorganic Chemistry - Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Chromium, Hexavalent .....:	<0.005	mg/L	0.005	08-18-93

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Westech Laboratories Inc.
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[illegible] East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8708

QUALITY CONTROL REPORT

QC IDENTIFIER .....: 7-081893-5a
REFERENCE NOTEBOOK : WW-089
REFERENCE PAGE ....: 93

INSTRUMENT : Hitachi V-2000 Spectrophotometer
ANALYZED BY : C. KOROGHLANIAN
ANALYZED ON : 08-18-93

TEST DESCRIPTION ..: Chromium, Hexavalent
TEST METHOD .....: 3500-Cr-D

SAMPLES IN THIS RUN: 9317471 9317472 9317473 9317474 9317475 9317476 9317477 9317478 9317479 9317480 9317481 9317482 9317483 9317484 9317512

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Chromium, Hexavalent	mg/L	0.100	.1012	101.2
Chromium, Hexavalent	mg/L	0.100	.1064	106.4
Chromium, Hexavalent	mg/L	0.500	.5242	104.8
Chromium, Hexavalent	mg/L	0.500	.5164	103.3

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
9317483	Chromium, Hexavalent	mg/L	0.87	0.85	2.3
9317479	Chromium, Hexavalent	mg/L	0.87	0.90	3.4

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
9317476	Chromium, Hexavalent	mg/L	<0.005	.5	.5360	107.2
9317484	Chromium, Hexavalent	mg/L	<0.005	.5	.5491	109.8

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Chromium, Hexavalent	mg/L	<0.005

QUALITY CONTROL REPORT

QC IDENTIFIER .....: 7-081893-5a
REFERENCE NOTEBOOK : WW-089
REFERENCE PAGE ....: 93

INSTRUMENT : Hitachi V-2000 Spectrophotometer
ANALYZED BY : C. KOROGHLANIAN
ANALYZED ON : 08-18-93

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

...RIES
...UALITY ASSURANCE OFFICER

SALT RIVER PROJECT
POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

September 14, 1992

Lahta Rajagopalan
Hazardous Waste Management Division
U. S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Re: Amendments to Sampling and Analysis Plan
Navajo Generating Station (RCRA 009-90-0001)

Dear Ms. Rajagopalan:

As required in the Modification to Consent Agreement and Final Order that was executed on August 14, 1992, the Salt River Project is submitting a proposed plan for groundwater monitoring of the existing deep wells at the Navajo Generating Station. The sampling and analysis plan is intended as an amendment to the May 1991 "Sampling and Analysis Plan for Determining Potential Chromium Contamination at the Navajo Generating Station" that was approved by your office.

Monitoring of shallow groundwater at the Navajo Generating Station as also stipulated in Modification to Consent Agreement and Final Order, will be conducted according to the May 1991 Sampling and Analysis Plan. Please note, however, the shallow groundwater monitoring will incorporate the changes in scope that were documented in our August 1, 1991 letter to your office. These changes in scope relate to well purging procedures and analytical laboratory substitutions that were determined necessary based on field sampling experiences.

Salt River Project is preparing to implement the groundwater monitoring and will proceed promptly pending EPA approval. Please contact me with any questions or comments.

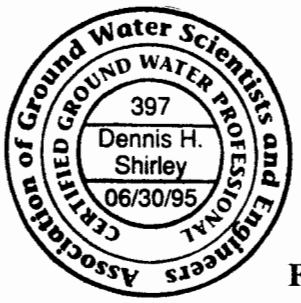
Sincerely,

Dennis H. Shirley, Senior Scientist
Environmental Services

DHS:dg
Enclosures

cc: Sadie Hoskie, Navajo Environmental Protection Agency
Deborah Jamieson, Salt River Project

WW-9704.992



SAMPLING AND ANALYSIS PLAN FOR DEEP GROUNDWATER MONITOR WELLS

NAVAJO GENERATING STATION PAGE, ARIZONA

OBJECTIVES AND SCOPE OF WORK

The objective of the Sampling and Analysis Plan (SAP) is to document the procedures and methods to be utilized for detecting any hexavalent chromium in the Navajo Sandstone aquifer underlying the Navajo Generating Station (NGS). Monitoring for hexavalent chromium will be conducted quarterly for a period of one (1) year using the three (3) existing NGS deep wells.

The Salt River Project consents to perform the deep groundwater monitoring solely to resolve Environmental Protection Agency (EPA) concerns that chromium observed in a single shallow groundwater monitor well may have migrated to the deeper Navajo Sandstone aquifer. The provision for the additional groundwater monitoring is specified in Modifications to the Consent Agreement and Final Order (CA/FO) executed on August 14, 1992.

PREFACE

This Sampling and Analysis Plan is intended as an amendment to the "Sampling and Analysis Plan for Determining Potential Chromium Contamination at the Navajo Generating Station" dated May, 1991 ("May, 1991 SAP"). Field and laboratory procedures will follow the May, 1991 SAP unless otherwise specified in this Sampling and Analysis Plan.

BACKGROUND

SITE HYDROGEOLOGY

A discussion of the local hydrogeology is provided in the May, 1991 SAP in section 2.2. Since the deep NGS monitor wells were drilled and constructed to monitor groundwater conditions in the Navajo Sandstone, a brief review of the hydrogeology of the Navajo Sandstone is as follows.

The Navajo Sandstone is composed of uniform, fine to medium, white to light brown quartz sand. This sandstone is one of the most prominent formations in the region

and is widely recognized over most of the Colorado Plateau. In the vicinity of the Navajo Generating Station, the Navajo Sandstone is greater than 1,500 feet thick. The formation is conspicuously and extensively characterized by high angle and large scale cross beds. The sandstone weathers in outcrop to an irregular topography of rounded hills, long escarpments, and deep canyons.

Groundwater is observed in the Navajo Sandstone at an approximate depth of 900 to 980 feet below ground surface at the Navajo Generating Station. Water level measurements made on the three existing NGS deep wells indicate that groundwater flow is to the northwest at a gradient of approximately 40 feet per mile. Additional detail on the Navajo Sandstone hydrology is provided in section 2.2.2.3 of the May, 1991 SAP.

The general water quality of the Navajo Sandstone aquifer, as determined from groundwater samples collected in the three existing NGS deep wells on August 13-14, 1991, is summarized below:

PARAMETER	DEEP WELL #1	DEEP WELL #2	DEEP WELL #3
Calcium	23.4	19.0	31.2
Magnesium	9.83	9.14	12.00
Sodium	5.74	5.72	10.50
Potassium	<1.0	<1.0	2.50
Chloride	14.20	10.60	10.60
Sulfate	15.50	7.45	9.83
Bicarbonate	30.5	27.5	27.5
Aluminum	0.27	<0.08	0.71
Boron	<0.06	<0.06	0.07
Fluoride	<0.1	<0.1	<0.1
Iron	0.92	1.20	3.62
Silica	13.3	16.6	16.6
Nitrate (as NO_3)	18.4	13.7	13.7

The water quality indicates the aquifer consists of calcium bicarbonate character groundwater that is representative of indigenous formation water for the Navajo Sandstone.

DEEP MONITOR WELL CONSTRUCTION

The locations of the three existing NGS deep wells are shown in Figure 1. Drilling, construction, and completion details are as follows.

Deep well #1 was drilled in 1979 by B.J. Drilling Company of Benson, Arizona using a rotary drill rig. The driller's log of this boring indicates that the drill hole penetrated the Carmel Formation from ground surface to a depth of approximately 50 feet and encountered Navajo Sandstone below this contact to the total depth of 1,200 feet. The well was constructed by installing eight (8) inch steel casing to a depth of 60 feet and cementing in place. Below a depth of 60 feet the borehole was left uncased and open to the Navajo Sandstone. The borehole diameter is eight inches to a depth of 60 feet and 6-3/4 inches for the open hole portion of the deep well. The well was completed at the surface with a casing seal, monitoring port, and locking steel plate on top of the surface casing. Figure 2 presents an as-built construction diagram for deep well #1.

Deep well #2 was drilled in 1981 by Cave Creek Well Drilling and Pump Company of Cave Creek, Arizona using a rotary drill rig. The driller's log of this boring indicates that the drill hole penetrated the Carmel Formation from ground surface to a depth of approximately 50 feet and encountered Navajo Sandstone below this contact to the total depth of 1,500 feet. The well was constructed by installing eight (8) inch steel casing to a depth of 56 feet and cementing in place. Below a depth of 56 feet the borehole was left uncased and open to the Navajo Sandstone. The borehole diameter is eight inches to a depth of 56 feet and 6-3/4 inches for the open hole portion of the deep well. The well was completed at the surface with a casing seal, monitoring port, and locking steel plate on top of the surface casing.

Deep well #2 was modified in 1989 to eliminate a minor seep of water entering the open borehole at a depth of about 122 feet. To seal the well in the upper interval of the Navajo Sandstone, four inch steel casing was set in the hole above a packer shoe to a depth of 660 feet. Cement and volclay grout were used to seal the annular space between the four inch steel casing string and borehole wall. Below a depth of 660 feet the well was left open and uncased. Figure 3 shows an as-built construction diagram for the renovated well.

Deep well #3 was drilled in 1981 by Cave Creek Well Drilling and Pump Company of Cave Creek, Arizona using a rotary drill rig. The driller's log of this boring indicates that the drill hole penetrated the Navajo Sandstone throughout the 1,500 total depth of this hole. The well was constructed by installing eight (8) inch steel casing

to a depth of 20 feet and cementing in place as a protective surface casing. Below a depth of 20 feet the borehole was left uncased and open to the Navajo Sandstone. The borehole diameter is eight inches to a depth of 20 feet and 6-3/4 inches for the open hole portion of the deep well. The well was completed at the surface with a casing seal, monitoring port, and locking steel plate on top of the surface casing. Figure 4 presents an as-built construction diagram for deep well #3.

Due to the extreme depth to water and total depth of these wells, all previous sampling has been conducted using a stainless steel bailer lowered via wire line to collect groundwater below the static water level in the open borehole. For the purposes of the groundwater sampling program consented to in the modified CA/FO, dedicated pumping equipment will be installed, where feasible, in the existing deep monitor wells. The pumps will allow adequate purging of the well to produce fresh formation water for sampling at the wellhead.

The deep wells will be equipped with four inch stainless steel electrical submersible pumps to be installed 20 feet below the pumping water level. The deep set pumps are capable of producing approximately ten gallons per minute when set at a depth of 1,000 feet. The pumps will be connected to the well head with stainless steel and galvanized steel riser pipe and control wires. Stainless steel will be attached to the submerged pump and extend ten feet above the static water level. Galvanized steel will be joined to the stainless steel riser above this level. The riser pipe will be secured at the surface to a sanitary well seal. The wells will also be equipped with a one half inch PVC sounder tube for water level measurements. Water will discharge at the well head through a dedicated discharge pipe having a flow meter assembly and valved sample port that couples to the riser pipe. All downhole equipment including pumps and piping will be washed with high pressure, hot water prior to installation.

GROUNDWATER SAMPLING PROTOCOL

The field methods and procedures for sample collection from the three existing deep wells will be as follows:

REQUIRED ACTIVITIES

Samples will be collected from the three (3) existing deep monitor wells at the Navajo Generating Station and analyzed for hexavalent chromium. The sampling will be conducted by the SRP Environmental Services Department for four (4) consecutive quarters over a one (1) year period. Laboratory analyses will be conducted by Westech Laboratories, Incorporated of Phoenix, Arizona.

STATIC WATER LEVEL MEASUREMENTS

Water levels will be measured in the three existing deep wells using an electric sounding device lowered by wireline via the sounder tube or down the open borehole. Static water level measurements will be recorded prior to purging the well for sample collection. The measurements will be obtained from a predetermined standard measuring point and recorded to the nearest 0.1 foot. The water level measurements will be recorded on a separate Groundwater Monitoring Field Data Report Form as shown in Figure 5.

WELL PURGING

Where the deep wells are equipped with dedicated submersible pumps, the wells will be purged of at least three borehole volumes prior to sample collection to ensure water quality samples are representative of aquifer conditions. The volume of water to be removed will be calculated based on the volume of water contained in the well at the time of purging. Electrical conductivity (EC), pH, and temperature of the purged water will be measured at the completion of pumping each borehole volume during the purging process and recorded on a Groundwater Monitoring Field Data Report Form. Stabilization of these field measured parameters (defined as measurements within +/- 10% over the time required to purge one borehole volume of well water) will be used to verify when the purging is sufficient to ensure a representative water quality sample. If the field measurements fail to stabilize after pumping three borehole volumes, pumping will continue until the parameters are stable. The total quantity of water purged from the well will be recorded on the Groundwater Monitoring Field Data Report Form.

Based on previous sample collection and analysis of static groundwater in the deep wells, the groundwater is known to be of low total dissolved solids (TDS) and have low level or non-detectable hexavalent chromium concentrations. As such, provisions will not be made to containerize the purge water. The purge water will, however, be retained on NGS properties.

If it is not feasible to install a dedicated pump in any of the deep wells (e.g. deep well #2), then the requirement to purge that well will be eliminated.

FIELD EQUIPMENT CALIBRATION

During the well purging and sampling process, water from each well will be monitored for electrical conductivity, pH, and temperature. The instruments used to make these measurements require calibration prior to each day's activities and between wells. The protocols below review the calibration process. The manufacturer's instructions for calibration and maintenance, and EPA accepted

protocols, will be consulted and followed.

1) Electrical Conductivity Meter

Conductivity meters used in the field will be calibrated and inspected prior to use. A calibration log will be maintained and will include the date, time, meter identification, temperature of the solution to the nearest 0.1 degree Centigrade, certified and measured conductance values for the standard solutions used, and other information associated with the inspection.

Conductivity meters will be calibrated prior to each day's activities and between wells with reagent grade potassium chloride standards. A temperature correction will be applied during calibration for those measurements made with meters that do not compensate for temperature. The calibration of the conductivity meters will be recorded on the Groundwater Monitoring Field Data Report Form.

2. pH Meters

pH meters used in the field will be calibrated and inspected prior to use. A calibration log will be maintained and will include the date, time, meter identification, temperature to the nearest 0.1 degree Centigrade, certified buffers (e.g. 4.0, 7.0, and 10.0) and measured pH values, and other information associated with the inspection.

pH meters will be calibrated each day and prior to use at each well with standard pH buffers. Prior to use at each well a two-buffer calibration will be performed with buffers whose pH values bracketed the anticipated values for the sample to be measured. The results of the initial daily and field calibrations will be recorded on the Groundwater Monitoring Field Data Report Form.

3. Temperature Measurements

Temperature measurements will be made to the nearest 0.1 degree Centigrade with thermometers calibrated against a NBS Certified thermometer. Thermometers used in the field will be checked for accuracy prior to initial use.

SAMPLE COLLECTION

The water samples will be collected immediately following well purging. The samples will be collected from the surface discharge point of the dedicated submersible pump. If it is not feasible to install a dedicated pump in any of the deep

wells (e.g. deep well #2), then the sample will be collected with a stainless steel bailer lowered via wireline to collect groundwater below the static water level in the open borehole. The samples will be stored in containers and using the preservation technique described in the following section.

SAMPLE CONTAINERS AND PRESERVATION

Groundwater samples will be stored in a 250 milliliter high-density polyethylene (HDPE) bottle and preserved by cooling to four degrees Centigrade. The sample bottles will be provided in a pre-cleaned condition by Westech Laboratories, Incorporated.

SAMPLE IDENTIFICATION, HANDLING, AND CUSTODY

Specific instructions for sample identification, handling, and transfer of custody are found in sections 4.7 and 4.8 of the May, 1992 SAP.

Due to the 24 hour holding time restriction for the hexavalent chromium analysis, it is particularly important to assure the timely transfer of the water samples to the analytical laboratory. To accomplish this, samples shall be collected in the afternoon and transported to Phoenix as air freight on the Skywest Airlines. Skywest has a daily flight that departs Page at 4:25 p.m. and arrives in Phoenix at 6:00 p.m.. The samples will be packaged in a secure cooler (as specified in section 4.7.2 of the May, 1991 SAP) and submitted to Skywest at least thirty minutes prior to the scheduled departure. The coolers and cargo manifest should be labeled: Hold for Pick Up by Westech Laboratories, Incorporated. Westech Laboratories will then coordinate the pick up of the samples from Skywest air cargo and initiate the laboratory analysis within the 24 hour sample holding time.

QUALITY CONTROL SAMPLES

Blanks and duplicates will be submitted to the lab to help evaluate the field sampling and laboratory procedures. A field blank will be collected with each round of deep well sampling as a check against cross contamination during collection, in transportation, and within the laboratory. The field blank will be prepared by pouring distilled water into a sample container. The field blank will then be numbered, packaged, and sealed in an identical manner to the other water samples collected so that is unknown to laboratory personnel performing the analysis.

One duplicate sample will be collected with each round of deep well sampling. Care will be taken to ensure that as true a duplicate as possible is obtained. The duplicate sample will be collected, numbered, packaged, and sealed in the same manner as the other water samples so that is unknown to laboratory personnel performing the analysis.

DOCUMENTATION OF SAMPLE COLLECTION

Field notes documenting sample collection will be entered on a Groundwater Field Data Report Form (shown in Figure 5). Copies of the Groundwater Field Data Report Form will be included with quarterly groundwater monitor reports submitted to the EPA.

Chain-of-custody (COC) forms will be completed for groups of samples collected each day. The COC form will be completed by the field technicians as samples are collected. The completed form is to accompany the samples to the laboratory. Figure 6 presents a copy of the COC form to be used for the sampling program. Copies of the COC forms will be included with quarterly groundwater monitor reports submitted to the EPA.

All documentation will be made in indelible ink. Corrections made to any document will be made by drawing a line through the error and entering the correct information. Both the error and correct information must be readable. The person making the correction will initial the document where the changes are made.

LABORATORY ANALYTICAL PROCEDURES

Westech Laboratories Incorporated of Phoenix, Arizona has been chosen to perform laboratory testing of the groundwater samples for hexavalent chromium analyses. Westech Laboratories will be utilized to ensure that sample analyses will be initiated within the 24 hour holding time for hexavalent chromium determination. A copy of Westech Laboratories quality assurance manual is available upon request.

ANALYTICAL PROCEDURE

U.S. EPA Method 7196 will be used to evaluate the hexavalent chromium concentration in the groundwater samples. A discussion of the test method is given in the May, 1991 SAP.

SAMPLE HOLDING TIME

The holding time for hexavalent chromium analysis of water samples by method 7196 is 24 hours.

DATA REPORTING AND MANAGEMENT

As specified in the Modifications to the Consent Agreement and Final Order (CA/FO) executed on August 14, 1992, the results of quarterly groundwater sampling and analyses shall be submitted to the EPA within thirty (30) days of SRP's receipt of the analytical data. The results will be submitted in a Quarterly Groundwater Monitoring Report that includes:

- tabulated water level data
- tabulated water quality data
- laboratory analytical reports
- laboratory QA/QC data reports
- field data report forms

Two copies of the Quarterly Groundwater Monitoring Report will be submitted to:

Ms. Lahta Rajagopalan
Hazardous Waste Management Division (H-2-2)
U.S. Environmental Protection Agency Region IX
75 Hawthorne Street
San Francisco, CA 94105

A copy of the Quarterly Groundwater Monitoring Report will also be submitted to:

Ms. Sadie Hoskie
Navajo Environmental Protection Administration
Division of Natural Resources
P.O. Box 308
Window Rock, AZ 86515

FIGURE 1
DEEP GROUNDWATER MONITOR WELLS
NGS PLANT SITE AND ASH DISPOSAL AREA

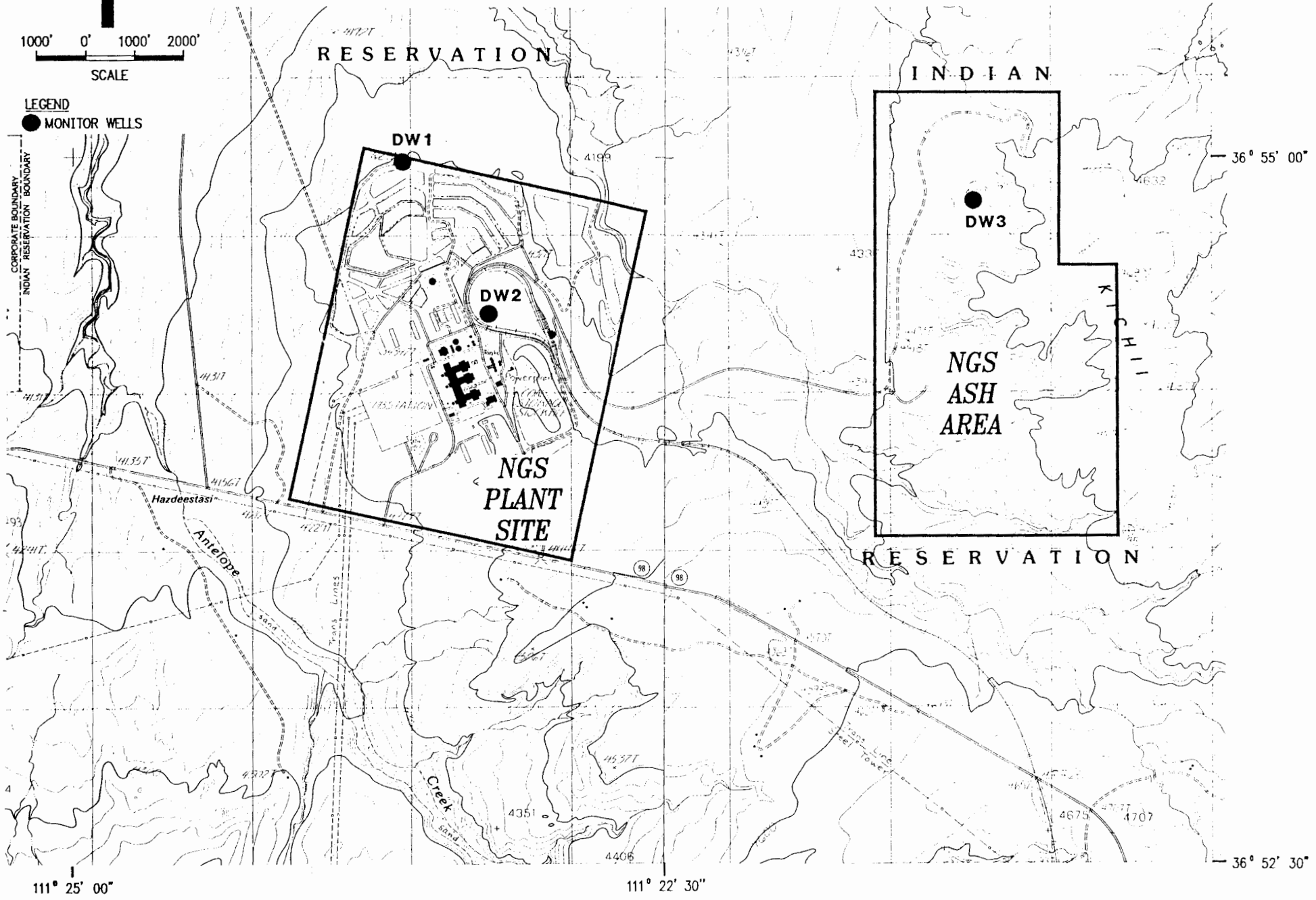
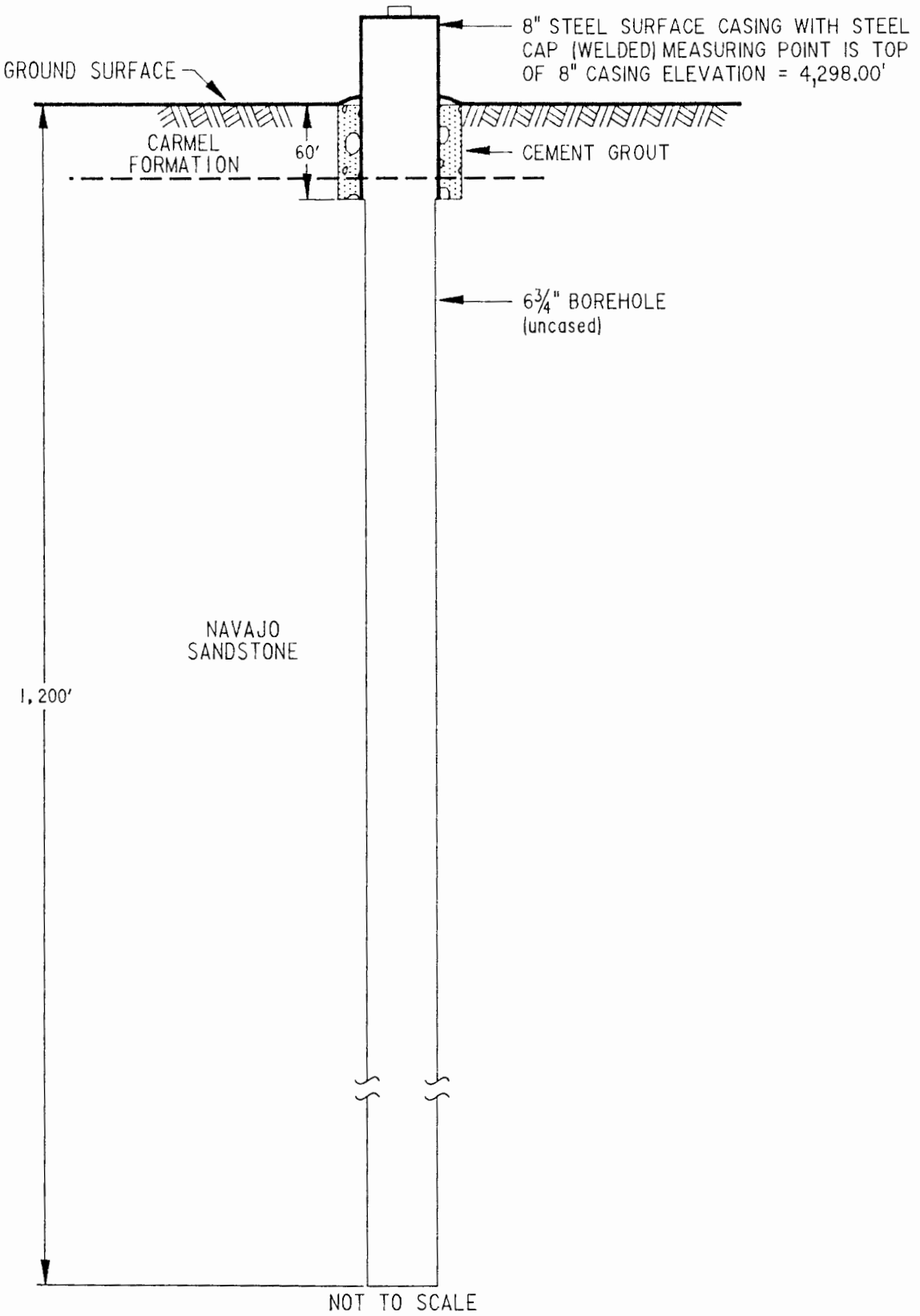
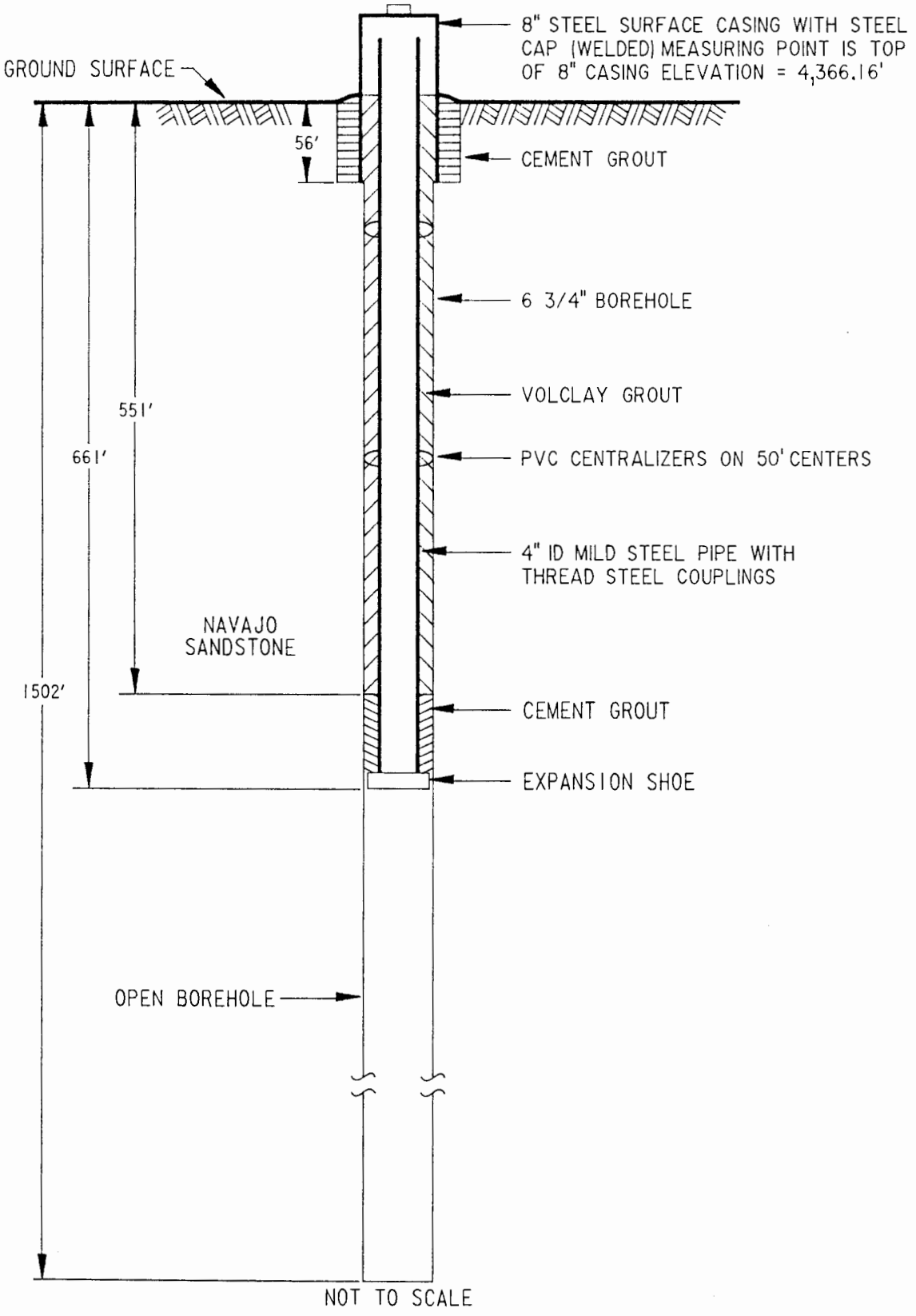


FIGURE 2
NGS DEEP WELL # 1
AS-BUILT CONSTRUCTION DIAGRAM



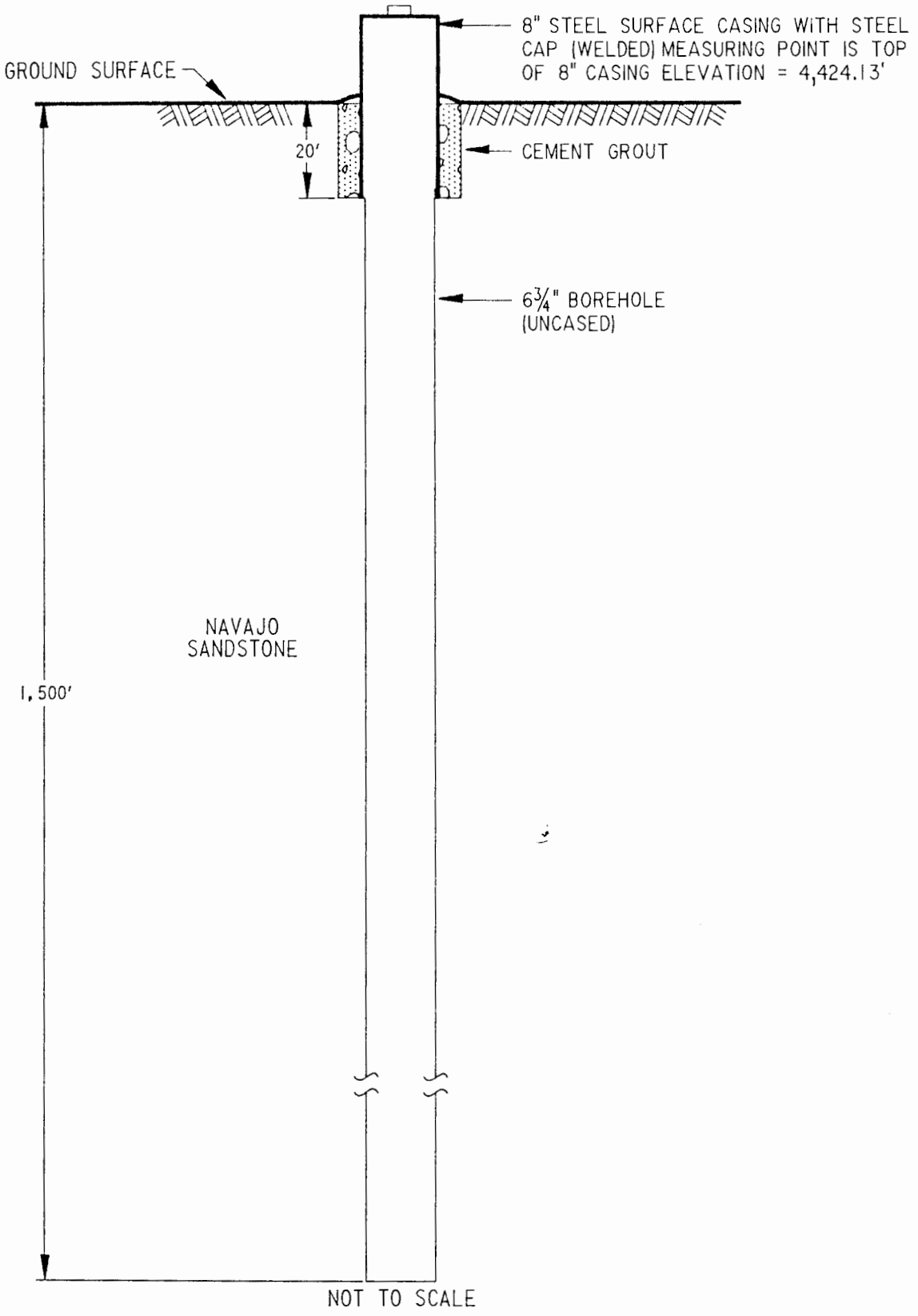
9/10/92
CAR:[140,77]
MVDWIF2.DGN

FIGURE 3
AS-BUILT WELL CONSTRUCTION DIAGRAM
SHOWING REPAIRS PERFORMED 9/89 AND 10/89
NGS DW2



9/1/92
CAR: [140, 77]
MVDW2F3.DGN

FIGURE 4
NGS DEEP WELL # 3
AS-BUILT CONSTRUCTION DIAGRAM



9/1/92
CAR:[140,77]
MVDW3F4.DGN

Figure 5

Groundwater Monitoring Field Data

Site _____ Date _____

Casing Diameter_____ Casing Depth _____ Pump Setting _____

Purging Data

SWl _____ Feet Of Water In Well _____ Gal. Water/Ft _____

1x Well Vol _____ 2x Well Vol _____ 3x Well Vol _____ 4x Well Vol _____ 5x Well Vol _____

Beginning Flowmeter Reading _____ Start Time _____

Instrument Calibration

Std	7.0	10.0	Std	1000	10,000
pH			pH		

	Meterread	EC	pH	1°	Q (GPM)	Remarks
Start						
1x Vol						
2x Vol						
3x Vol						
4x Vol						
5x Vol						

Ending Flowmeter Reading _____ Gallons Pumped _____ Sample Time _____

Additional Comments:

_____

_____

_____

_____

_____

_____

Sampled by:

_____ _____

Print Signature Signature

FIGURE 6

CHAIN OF CUSTODY RECORD

Westech Laboratories Inc.

ix • 3737 E. Broadway Rd. • AZ 85040 • (602) 437-1080 • fax 437-8706
aff • 2400 E. Huntington Dr. • AZ 86004 • (602) 774-8708 • fax 774-6469
o • 10737 Gateway West #100 • TX 79935 • (915) 592-3591 • fax 592-3594

CLIENT	ADDRESS	
TELEPHONE	PROJECT	JOB / P.O. NO.

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

LER (SIGNATURE)		SAMPLER (PLEASE PRINT)		HOLD	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	REQUESTED ANALYSES											SAMPLE TYPE CODES: S – SOIL, W – WATER, O – OIL, G – SLUDGE, T – TRAVEL BLANK, F – FIELD BLANK, X – OTHER	
CLIENT SAMPLE IDENTIFICATION NUMBER	DATE	TIME	SAMPLE LOCATION																	COMMENTS	LABORATORY SAMPLE IDENTIFICATION NUMBER

QUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	REMARKS
QUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	
QUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	
QUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	

White - Testing Laboratory; Yellow - Department Job File; Pink - Client

SALT RIVER PROJECT
POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

August 18, 1992

Ms. Latha Rajagopalan
Compliance Officer
Hazardous Waste Management Division
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Re: RCRA 009-90-0001/Navajo Generating Station Modification to Consent Agreement and Final Order

Dear Ms. Rajagopalan:

Enclosed is Salt River Project's executed signature page for the above-referenced Modification to Consent Agreement and Final Order. As agreed, the effective date of the Modification is August 14, 1992.

We will be forwarding to you the revised Sampling and Analysis Plan as soon as possible before its due date, September 14, 1992. We have determined that there are no water supply wells located within one mile of the Navajo Generating Station.

Dennis Shirley will continue to be Salt River Project's contact person on this matter. He can be reached at 602/236-2685.

Sincerely,

Deborah A. Jamieson

Deborah A. Jamieson
Staff Attorney

DAJ/fw
Enclosure

cc: Thelma Estrada, EPA/Region IX, w/o enclosure
Sadie Hoskie, Environmental Protection Administration, The Navajo Nation, with copy of Modification to Consent Agreement and Final Order
Dennis Shirley, SRP, with copy of Modification to Consent Agreement and Final Order

David G. Areghini

David Areghini
Associate General Manager,
Power Group
SALT RIVER PROJECT AGRICULTURAL
IMPROVEMENT AND POWER DISTRICT

August 14, 1992
Date

SALT RIVER PROJECT
POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-6699

Richard M. Hayslip
MANAGER
Environmental Services

August 17, 1992

Laura Yoshii, Assistant Director
Office of Waste Programs
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105

Re: Revised Section 3010 Notification of Regulated Waste Activity
Navajo Generating Station
EPA ID Number AZD074452426

Dear Ms. Yoshii:

Salt River Project is enclosing with this letter a copy of the revised Section 3010 Notification of Regulated Waste Activity for the Navajo Generating Station, a coal-fired steam electric utility located near Page, Arizona. We have sent the original Notification, dated August 10, 1992, to the RCRA/PRC group. Salt River Project is the operating agent for the Navajo Generating Station.

The Navajo Generating Station is a large quantity generator of hazardous waste, as stated in its most recent Section 3010 Notification, dated November 18, 1988. Hazardous waste is disposed off-site at permitted disposal or treatment facilities. The Navajo Generating Station does not have a RCRA permit to treat, store or dispose of hazardous waste on-site.

Salt River Project discovered recently, however, that in April, 1991, waste water was discharged to a lined on-site surface impoundment at the Navajo Generating Station during routine maintenance on a boiler at the plant. The chromium in that waste water apparently exceeded 5.0 mg/l, thereby making the waste water hazardous waste due to its

toxicity characteristic. The chromium levels were not known until some time after the discharge when the contractor who did the boiler cleaning forwarded to Navajo Generating Station the results of analyses done on the waste water.[1]

Navajo Generating Station has revised its boiler cleaning procedures to ensure that any hazardous waste from the periodic cleaning of boilers will not be discharged on-site. During the 1992 boiler cleanings in March and April, the waste water was collected and a mobile physical/chemical treatment process was used to convert the waste water to non-hazardous sediment and reusable water. The water was reused in the plant's ash recycle system. The dewatered sediment was placed in an on-site landfill.

Salt River Project also conducted in July, 1992, a site investigation of the surface impoundment to which the boiler cleaning waste water was discharged. The investigation, conducted by our consultant, Brown & Caldwell, included sampling water and sediment in the impoundment, water and sediment that had collected beneath the impoundment liner, and water and sedimentary rock from shallow monitor wells installed around the impoundment perimeter. Chromium levels did not exceed the 5.0 mg/l TCLP limit for chromium. In fact, chromium was below detectable levels in the water samples taken from the shallow monitor wells and from beneath the impoundment liner.

Salt River Project believes that neither RCRA nor its regulations require a revised Section 3010 Notification to be filed with EPA in this instance. Stating that the Navajo Generating Station is a "Treater, Storer, or Disposer" on the Section 3010 Notification is not accurate in this case, since Navajo Generating Station does not intend to discharge boiler cleaning waste water on-site, and has taken the appropriate steps to protect against such a discharge. Nevertheless, we are aware that EPA takes the position that a revised Section 3010 Notification should be filed. Salt River Project has made the decision, therefore, to file a revised Section 3010 Notification, and to voluntarily disclose to EPA that a discharge of hazardous waste likely occurred on-site at Navajo Generating Station in 1991.

---

[1] The analyses were not done to characterize the waste pursuant to RCRA, but for the contractor to determine the efficiency of its cleaning process.

Please contact Dan Casiraro at telephone number 602/236-2811, if further information is needed or additional action is necessary.

Sincerely,

Richard Hayslip

Richard M. Hayslip
Manager
Environmental Services

RMH/fw
Enclosure

cc: Sadie Hoskie, Director, EPA, The Navajo Nation

Please refer to the instructions for Filing Notification before completing this form. The information requested here is required by law (Section 3010 of the Resource Conservation and Recovery Act).

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)

I. Installation's EPA ID Number (Mark 'X' in the appropriate box)

[ ] A. First Notification [XX] B. Subsequent Notification (complete item C)

C. Installation's EPA ID Number: AZD074452426

II. Name of Installation (Include company and specific site name)

SALT RIVER PROJECT - NAVAJO GEN

III. Location of Installation (Physical address not P.O. Box or Route Number)

Street: 5 Miles East of Page, Arizona

Street (continued): on Highway 98

City or Town: Page, | State: AZ | ZIP Code: 86040-

County Code: | County Name: Coconino

IV. Installation Mailing Address (See Instructions)

Street or P.O. Box: PO Box W

City or Town: Page | State: AZ | ZIP Code: 86040-

V. Installation Contact (Person to be contacted regarding waste activities at site)

Name (last): Candelaria | (first): Robert

Job Title: Supv Env & Lab | Phone Number (area code and number): 602-645-8811

VI. Installation Contact Address (See Instructions)

A. Contact Address Location [ ] Mailing [X] | B. Street or P.O. Box:

City or Town: | State: | ZIP Code: -

VII. Ownership (See Instructions)

A. Name of Installation's Legal Owner: Salt River Project

Street, P.O. Box, or Route Number: PO Box 52025

City or Town: Phoenix | State: AZ | ZIP Code: 85072-2025

Phone Number (area code and number): 602-236-2811

B. Land Type: I

C. Owner Type: P

D. Change of Owner Indicator: Yes [ ] No [X] (Date Changed) Month Day Year:

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved OMB [illegible] GSA No. 0246 EPA [illegible]

ID – For Official Use Only

VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

A. Hazardous Waste Activity

1. Generator (See Instructions)
   - [XX] a. Greater than 1000kg/mo (2,200 lbs.) (see XI. comments)
   - [ ] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

   Mode of Transportation
   - [ ] 1. Air
   - [ ] 2. Rail
   - [ ] 3. Highway
   - [ ] 4. Water
   - [ ] 5. Other – specify
3. [ ] Treater, Storer, Disposer (at installation) (XI. Comments) Note: A permit is required for this activity; see instructions.
4. Hazardous Waste Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Burner – indicate device(s) – Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
5. [ ] Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Markerer
   - [ ] c. Burner – indicate device(s) – Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
2. [X] Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

IX. Description of Regulated Wastes *(Use additional sheets if necessary)*

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40 CFR Parts 261.20 - 261.24)*

1. Ignitable *(D001)*	2. Corrosive *(D002)*	3. Reactive *(D003)*	4. EP Toxic *(D000)*	(List specific EPA hazardous waste number(s) for the EP Toxic contaminant(s))			
X	X		X	D006	D007	D008	D009

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
F001	F002	F003	F005		
7	**8**	**9**	**10**	**11**	**12**

C. Other Wastes. (State or other wastes requiring an I.D. number. See instructions.)

1	2	3	4	5	6

X. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature	Name and Official Title *(type or print)*	Date Signed
Charles D. Brumback	Charles Brumback, Plant Manager	8/10/92

XI. Comments

In 1991 wastewater that probably exceeded the toxicity limit for Chromium was discharged to an on-site surface impoundment. Management procedures have been revised and no such discharge occurred in 1992.

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

Mr. Richard Hayslip, Manager
Environmental Services Dept.
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Subject: Groundwater Monitoring at Navajo Generating Station pursuant to RCRA CA/FO (Docket # 009-90-0001)

Dear Mr. Hayslip:

Based on a review of the four quarters of groundwater monitoring conducted by Salt River Project at the Navajo Generating Station pursuant to the modified CA/FO of August 14,1992, EPA verifies that all tasks have been completed satisfactorily. This will therefore return Salt River Project to compliance with the applicable RCRA provisions, and will close Docket Number RCRA 009-90-0001.

Please call Ms. Latha Rajagopalan, of my staff, at (415)744-2025, or Ms. Thelma Estrada, of our Office of Regional Counsel, at (415)744-1382, should you have any questions.

Sincerely,

Jeffrey Zelikson

cc: Sadie Hoskie, Navajo EPA

SYMBOL		ORC				
SURNAME		Tetreda				
DATE		6/30/92				

U.S. EPA CONCURRENCES OFFICIAL FILE COPY

Ms. Jane D. Alfano
Manager, Legal Services
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Re: Navajo Generating Station CA/FO Modification

Dear Ms. Alfano:

As requested by Ms. Susan Sawtelle of Piper & Marbury, please find enclosed the signature page for the Navajo Generating Station CA/FO modification agreed to by both SRP and EPA. Please contact me at 415-744-2029 if you have any questions.

Sincerely,

Latha Rajagopalan
Compliance Officer

cc: Mr. Dennis Shirley
Environmental Services Dept.
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Ms. Susan Sawtelle
Piper & Marbury
1200 Nineteenth St., N.W.
Washington, D. C. 20036-2430

Ms. Sadie Hoskie, Acting Director
Navajo EPA
Division of Natural Resources
P. O. Box 308
Window Rock, AZ 86515

Alice,
This is page 4 of A: NGSLET. pls. print this page only, on letterhead, & prepare an envelope.
Thx
Latha

Ms. Jane D. Alfano
Manager, Legal Services
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Re: Navajo Generating Station CA/FO Modification

Dear Ms. Alfano:

As requested by Ms. Susan Sawtelle of Piper & Marbury, please find enclosed the signature page for the Navajo Generating Station CA/FO modification agreed to by both SRP and EPA. Please contact me at 415-744-2029 if you have any questions.

Sincerely,

Latha Rajagopalan
Compliance Officer

cc: Mr. Dennis Shirley
Environmental Services Dept.
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Ms. Susan Sawtelle
Piper & Marbury
1200 Nineteenth St., N.W.
Washington, D. C. 20036-2430

Ms. Sadie Hoskie, Acting Director
Navajo EPA
Division of Natural Resources
P. O. Box 308
Window Rock, AZ 86515

PIPER & MARBURY
1200 NINETEENTH STREET, N.W.
WASHINGTON, D. C. 20036-2430
202-861-3900
FAX: 202-223-2085

BALTIMORE
NEW YORK
PHILADELPHIA
LONDON
EASTON, MD

SUSAN D. SAWTELLE
202-861-3864

June 29, 1992

BY FEDERAL EXPRESS

Thelma Estrada, Esq.
Office of Regional Counsel (RC-2-4)
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

Re: Salt River Project Agricultural Improvement and Power District: Navajo Generation Station, Docket No. RCRA-09-90-0001

Dear Thelma:

Enclosed as we discussed this afternoon is the modification to SRP's CA/FO, for execution by EPA. I have included two copies of the EPA signature page, and similarly I am providing SRP with two copies of its signature page. After execution by both sides, the parties can then exchange one copy of their respective signature pages so that both will have a fully executed "original."

You indicated that in your absence in the next three weeks, Latha will be obtaining the necessary EPA signatures. Please tell Latha to send the EPA-executed signature page to Jane Alfano, Manager of Legal Services at SRP in Phoenix. I will ask Jane to return the SRP-executed page to Latha in your absence.

Sincerely,

Susan D. Sawtelle

Enclosure

cc: Jane D. Alfano, Esq.
Dennis H. Shirley

EXECUTIVE CORRESPONDENCE

DO NOT WRITE ON THIS COVER AS IT IS INTENDED FOR RE-USE
RETURN IT WITH THE FILE COPIES TO ORIGINATING OFFICE

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IX

In re	Docket No. RCRA 009-90-0001
SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT:	CONSENT AGREEMENT AND FINAL ORDER
NAVAJO GENERATING STATION,	
Respondent.	

MODIFICATION TO CONSENT AGREEMENT AND FINAL ORDER

Pursuant to Article XIII, ¶ 26, of the Consent Agreement and Final Order ("CA/FO") entered into by the U.S. Environmental Protection Agency, Region IX ("EPA") and the Salt River Project Agricultural Improvement and Power District ("SRP") on January 5, 1991 in the above-captioned proceeding ("Initial CA/FO"), the parties hereby modify the CA/FO by adding the following provisions, which are deemed to be incorporated into the CA/FO as if fully set forth herein:

In addition to the tasks set forth in Article V of the Initial CA/FO, SRP consents to perform the following tasks:

1. Within sixty (60) days of the effective date of this Modification, SRP agrees to identify to EPA the locations, approximate depths, and present status (active or inactive) of all water supply wells, if any, which are located within one mile of the Facility.

2.(a) SRP agrees to continue its monitoring of the shallow groundwater underlying the Facility in the Carmel Formation for hexavalent chromium, at the locations and in the manner in which it has conducted such monitoring under the Sampling and Analysis Plan previously approved by EPA pursuant to ¶¶ 8-10 of the Initial CA/FO. SRP will take quarterly samples for one (1) additional year, and will provide the results of such sampling to EPA within thirty (30) days of SRP's receipt of the results.

(b) If the results of the sampling conducted under subparagraph (a) above for hexavalent chromium for monitoring wells other than Monitoring Well #71 are at or below the EPA-recommended exposure level for chromium, which currently is 0.1 mg/l, the shallow groundwater shall be deemed to meet the relevant and appropriate closure performance standards in 40 C.F.R. § 265.111 and no further sampling or other action shall be required under this CA/FO with respect to the shallow groundwater. If the sampling results for monitoring wells other than Monitoring Well # 71 are above the 0.1 mg/l level, SRP will take the actions set forth in ¶ 12 of the Initial CA/FO, except that the EPA-recommended exposure level for chromium in ¶ 12(c) of the Initial CA/FO shall be 0.1 mg/l.

3.(a) SRP also agrees to conduct quarterly monitoring for hexavalent chromium in the Navajo Sandstone aquifer by use of its three (3) existing deep monitoring wells screened in that aquifer, for a period of one (1) year, and will provide the results of such sampling to EPA within thirty (30) days of

SRP's receipt of the results. SRP also will prepare a draft amendment of its existing Sampling and Analysis Plan ("SAP"), prepared under the Initial CA/FO, to address the deep well monitoring. SRP shall submit its draft amended SAP to EPA within thirty (30) days of the effective date of this Modification. EPA shall promptly either approve the amended SAP or direct SRP to make additional amendments. If any amendments are directed by EPA, SRP shall revise and resubmit the SAP to include the additional amendments within thirty (30) days of receipt of EPA's comments. EPA shall not withhold its approval of SRP's amended SAP unreasonably, arbitrarily or capriciously. The amended SAP as approved by EPA shall be incorporated into this CA/FO as if fully set forth herein.

(b) If the results of the sampling conducted under subparagraph (a) above for hexavalent chromium are at or below 0.1 mg/l, the deep groundwater shall be deemed to meet the relevant and appropriate closure performance standards in 40 C.F.R. § 265.111 and no further sampling or other action shall be required under this CA/FO with respect to the deep groundwater. If the sampling results are above the 0.1 mg/l level, SRP will take the actions set forth in ¶ 12 of the Initial CA/FO except that the EPA-recommended exposure level for chromium in ¶ 12(c) of the Initial CA/FO shall be 0.1 mg/l.

4. This Modification shall be considered binding and in full effect upon the signature of both parties.

Laura Yoshii for JZ
Jeffrey Zelikson, Director
Hazardous Waste Management Division
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY, REGION IX

7/6/92
Date

SYMBOL	H-2-2	ORC	H-2-2	H-2	H-1-W	H-1
SURNAME	Rajagopalan	Tertiola	J. Blake for PB	Vaille	Lyon	Lyon for JZ
DATE	6/30/92	6/30/92	7/2/92	7/2/92	7/6/92	

U.S. EPA CONCURRENCES OFFICIAL FILE COPY

David Areghini
Associate General Manager,
Power Group
SALT RIVER PROJECT AGRICULTURAL
IMPROVEMENT AND POWER DISTRICT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

MAR 11 1992

Mr. Richard M. Hayslip
Manager
Environmental Services Dept.
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Subject: Navajo Generating Station, Page, Arizona
RCRA Docket No. 09-90-0001

Dear Mr. Hayslip:

We have reviewed the "Final Report on Soil and Groundwater Investigation" on Navajo Generating Station prepared by your staff and transmitted by your letter of October 17, 1991. The investigation and report were done as required by the Consent Agreement and Final Order (CA/FO) signed by SRP and EPA in January, 1991. The purpose of the investigation was to determine potential chromium contamination of soil and shallow groundwater from the past transport and spillage of bearing cooling water.

The soil and ground-water investigation performed by SRP and SRP's contractor Brown and Caldwell showed that all soil samples contained less than the established exposure level of total chromium (400 mg/kg). However, the investigation also showed that one of the five ground-water samples contained hexavalent chromium at levels 24 times higher (1.2 mg/l) than the exposure level of 0.05 mg/l, which was based on drinking water Maximum Contaminant Levels. This indicates that the ground water in this well has been contaminated with the bearing cooling water.

Based on the information from this investigation report, we conclude:

- No further soil investigations are needed.

- SRP should continue to monitor hexavalent chromium in the shallow monitoring wells (in the Carmel formation) on a quarterly basis for four consecutive quarters. This will help determine if chromium contaminants are migrating laterally. If this monitoring indicates that chromium

contaminants are migrating laterally, SRP will submit to EPA within 90 days a draft Remediation Plan designed to ensure that SRP will meet the relevant and appropriate closure performance standards set forth in §265.111, as outlined in Section V, Paragraph 12(b) of the signed CA/FO.

- The three existing deep monitoring wells screened in the Navajo Sandstone should also be monitored for hexavalent chromium on a quarterly basis, for four consecutive quarters, to ensure that contaminants have not migrated to the deeper Navajo aquifer from the Carmel. If monitoring indicates that contaminants have migrated to the Navajo from the Carmel, SRP will submit to EPA within 90 days a draft Remediation Plan designed to ensure that SRP will meet the relevant and appropriate closure performance standards set forth in §265.111, as outlined in Section V, Paragraph 12(b) of the signed CA/FO.

- Copies of the results of the quarterly sampling and analysis should be provided to EPA within 30 days of analysis.

- Within 60 days, SRP should determine the locations, depths, and present status of all water supply wells, if any, within one mile of the Facility to lend credibility to SRP's claim that the shallow chromium-contaminated ground water underlying NGS is not a threat to nearby residents.

EPA believes that these measures represent a reasonable and inexpensive course of action at this time, and proposes that the CA/FO be amended to reflect the above. Please contact me at (415) 744-2029 if you have any questions, or have Ms. Jamieson contact Ms. Thelma Estrada of our Office of Regional Counsel at (415) 744-1385 with any legal questions.

Sincerely,

Latha Rajagopalan

Latha Rajagopalan
Environmental Engineer

cc: Ms. Debbie Jamieson
Attorney
Salt River Project
P. O. Box 52025
Phoenix, AZ 85072-2025

Ms. Susan Sawtelle
Piper & Marbury
1200 Nineteenth St., N.W.
Washington, D. C. 20036-2430

Ms. Sadie Hoskie, Acting Director
Navajo EPA
Division of Natural Resources
P. O. Box 308
Window Rock, AZ 86515

SALT RIVER PROJECT

POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

W&W-9534

Overnight Mail

January 3, 1992

Ms. Lahta Rajagoplan
Compliance Officer
U.S. Environmental Protection Agency
Region IX (H-2-2)
75 Hawthorne Street
San Francisco, CA 94105

RE: Navajo Generating Station RCRA Docket #09-90-0001 - Consent Agreement and Final Order (CA/FO)

Dear Ms. Rajagoplan:

Pursuant to the requirement of the CA/FO, enclosed is the quarterly report for the Salt River Projects' (SRP) Navajo Generating Station. The quarterly report consists of the monthly hazardous waste activities for the months of October, November, and December of 1991.

The report identifies the amount and types of hazardous waste generated, the dates accumulation began, the name of the TSD to which the waste was shipped, the dates the waste was shipped, and copies of accompanying manifests (manifest document numbers 91N14 and 91N16; manifest 91N15 was a PCB shipment and is not included in this report).

Additionally, the report contains a 30-day accumulation request from SRP and approval from EPA for 9 containers that would exceed the 90-day accumulation period in December. The request stemmed from problems with the disposal facility not being able to accept wastes for a period of time due to plant problems as outlined in the request.

If there are any questions regarding this report, please contact me at (602) 236-2811.

Sincerely,

Daniel J. Casiraro

Daniel J. Casiraro
Principal Staff Engineer
Environmental Management Services

DJC:dg
Enclosures

cc: Jeffrey Zelikson, U.S. EPA
Sadie Hoskie, Acting Director, Navajo EPA

File: LOC-5-4/HZW-1-4

October Hazardous Waste Activities

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Oct, 1991

03JAN92:13:

CILITY: NAVAJO GEN STATION

EPA-ID: AZD074452

ONTAINER ID#	CONTENTS	ANLYS NUMBER	P A	A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE
S CENTRAL STORAGE															
TOTAL NGS CENTRAL STORAGE						0	0	0				0			
PREPARED BY:					APPROVED BY:										
S															
-90089	MERCURY		N	N	11/30/90	20	20	0				0	DM 16		
-91001	WASTE SOLVENT		N	N	01/01/91	110	110	0				0	DM 55		
-91042	WASTE SOLVENT		N	N	03/25/91	330	330	0				0	DM 55		
-91052	WASTE SOLVENT		N	N	04/17/91	330	330	0				0	DM 55		
-91054	WASTE SOLVENT		N	N	04/22/91	110	110	0				0	DM 55		
-91055	WASTE SOLVENT		N	N	05/02/91	330	330	0				0	DM 55		
-91059	SOIL-SOLVENT CONTAM		N	N	05/06/91	20	20	0				0	DM 12		
-91063	WASTE SOLVENT	91-230	Y	N	05/23/91	391	0	0	07/29/91	04/24/92	10/23/91	391	DM 55	91N14	11/27/91
-91141	WASTE SOLVENT	91-251	Y	N	03/25/91	392	392	0	09/03/91	12/02/91		0	DM 55		
-91143	WASTE SOLVENT	91-271	Y	N	05/13/91	330	400	70	10/01/91	12/30/91		0	DM 55		
-91144	WASTE SOLVENT		N	N	05/02/91	110	110	0				0	DM 55		
-91147	WASTE SOLVENT	91-272	Y	N	05/31/91	318	318	0	10/01/91	12/30/91		0	DM 55		
-91149	WASTE SOLVENT		N	N	06/07/91	110	110	0				0	DM 55		
-91167	GREASE		N	N	06/05/91	30	30	0				0	DM 12		
-91174	WASTE SOLVENT		N	N	07/19/91	110	110	0				0	DM 55		
-91181	WASTE SOLVENT	91-219	Y	N	07/25/91	353	0	0	07/25/91	04/20/92	10/23/91	353	DM 55	91N14	11/27/91
-91182	WASTE SOLVENT		N	N	07/25/91	216	0	0	07/25/91	04/20/92	10/23/91	216	DM 55	91N14	11/27/91
-91184	WASTE SOLVENT	91-259	N	N	08/01/91	373	373	0	09/05/91	12/04/91		0	DM 55		
-91190	WASTE SOLVENT		N	N	08/09/91	330	406	76	10/01/91	12/30/91		0	DM 55		
-91192	GREASE	91-252	Y	N	09/03/91	236	236	0	09/03/91	12/02/91		0	DM 55		
-91193	GREASE	91-253	Y	N	09/03/91	225	225	0	09/03/91	12/02/91		0	DM 55		
-91194	GREASE	91-254	Y	N	09/03/91	341	341	0	09/03/91	12/02/91		0	DM 55		
-91195	WASTE SOLVENT		N	N	09/03/91	110	110	0				0	DM 55		
-91196	WASTE PAINT		N	N	09/01/91	512	512	0	09/19/91	12/18/91		0	DM 55		
-91197	GREASE		N	N	09/05/91	110	110	0				0	DM 55		
-91198	WASTE SOLVENT	91-273	Y	N	09/05/91	330	377	47	10/01/91	12/30/91		0	DM 55		
-91199	WASTE SOLVENT		N	N	09/11/91	110	110	0				0	DM 55		
-91200	WASTE PAINT		N	N	09/21/91	110	427	317	10/21/91	01/19/92		0	DM 55		
-91201	WASTE SOLVENT	91-274	Y	N	10/01/91	0	232	232	10/01/91	12/30/91		0	DM 55		

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Oct, 1991

03JAN92:13

CILITY: NAVAJO GEN STATION

EPA-ID: AZD074452

		ON SITE ACCUMULATION							DISPOSAL INFORMATION					
ONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE
S-91202	WASTE SOLVENT	91-275	Y	N	10/01/91	0	396	396	10/01/91	12/30/91		0	DM 55		
S-91206	WASTE PAINT/SOLVENT		N	N	10/01/91	0	342	342	10/01/91	12/30/91		0	DM 55		
S-91207	WASTE ALCOHOL		N	N	10/01/91	0	341	341	10/01/91	12/30/91		0	DM 55		
S-91208	WASTE SOLVENT	91-280	Y	N	10/02/91	0	386	386	10/02/91	12/31/91		0	DM 55		
S-91212	WASTE OIL		N	N	10/11/91	0	446	446	10/11/91	01/09/92		0	DM 55		
S-91213	WASTE OIL/SOLVENTS		N	N	10/11/91	0	383	383	10/11/91	01/09/92		0	DM 55		
S-91214	WASTE PAINT		N	N	10/24/91	0	110	110				0	DM 55		
TOTAL NGS						6397	8583	3146				960			

PREPARED BY: DOUG LAUGHLIN APPROVED BY: BOB CANDELARIA

TOTAL NAVAJO GEN STATION						6397	8583	3146				960			

GENERATOR STATUS=LARGE QUANTITY GENERATOR*

LL WEIGHTS ARE IN POUNDS

November Hazardous Waste Activities

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Nov, 1991

03JAN92:13

ACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE
SS CENTRAL STORAGE															
TOTAL NGS CENTRAL STORAGE						0	0	0				0			
PREPARED BY:					APPROVED BY:										
SS															
SS-90089	MERCURY		N	N	11/30/90	20	20	0				0	DM 16		
SS-91001	WASTE SOLVENT		N	N	01/01/91	110	110	0				0	DM 55		
SS-91042	WASTE SOLVENT		N	N	03/25/91	330	330	0				0	DM 55		
SS-91052	WASTE SOLVENT		N	N	04/17/91	330	330	0				0	DM 55		
S-91054	WASTE SOLVENT		N	N	04/22/91	110	220	110				0	DM 55		
S-91055	WASTE SOLVENT		N	N	05/02/91	330	330	0				0	DM 55		
S-91059	SOIL-SOLVENT CONTAM		N	N	05/06/91	20	20	0				0	DM 12		
S-91140	WASTE SOLVENT		N	N	04/17/91	0	110	110				0	DM 55		
S-91141	WASTE SOLVENT	91-251	Y	N	03/25/91	392	392	0	09/03/91	12/02/91		0	DM 55		
S-91143	WASTE SOLVENT	91-271	Y	N	05/13/91	400	400	0	10/01/91	12/30/91		0	DM 55		
S-91144	WASTE SOLVENT		N	N	05/02/91	110	110	0				0	DM 55		
S-91147	WASTE SOLVENT	91-272	Y	N	05/31/91	318	318	0	10/01/91	12/30/91		0	DM 55		
S-91149	WASTE SOLVENT		N	N	06/07/91	110	220	110				0	DM 55		
S-91167	GREASE		N	N	06/05/91	30	30	0				0	DM 12		
S-91174	WASTE SOLVENT		N	N	07/19/91	110	220	110				0	DM 55		
S-91184	WASTE SOLVENT	91-259	N	N	08/01/91	373	373	0	09/05/91	12/04/91		0	DM 55		
S-91190	WASTE SOLVENT		N	N	08/09/91	406	406	0	10/01/91	12/30/91		0	DM 55		
S-91192	GREASE	91-252	Y	N	09/03/91	236	236	0	09/03/91	12/02/91		0	DM 55		
S-91193	GREASE	91-253	Y	N	09/03/91	225	225	0	09/03/91	12/02/91		0	DM 55		
S-91194	GREASE	91-254	Y	N	09/03/91	341	341	0	09/03/91	12/02/91		0	DM 55		
S-91195	WASTE SOLVENT		N	N	09/03/91	110	110	0				0	DM 55		
S-91196	WASTE PAINT		N	N	09/01/91	512	512	0	09/19/91	12/18/91		0	DM 55		
S-91197	GREASE		N	N	09/05/91	110	110	0				0	DM 55		
S-91198	WASTE SOLVENT	91-273	Y	N	09/05/91	377	377	0	10/01/91	12/30/91		0	DM 55		
S-91199	WASTE SOLVENT		N	N	09/11/91	110	110	0				0	DM 55		
S-91200	WASTE PAINT		N	N	09/21/91	427	427	0	10/21/91	01/19/92		0	DM 55		
S-91201	WASTE SOLVENT	91-274	Y	N	10/01/91	232	232	0	10/01/91	12/30/91		0	DM 55		
S-91202	WASTE SOLVENT	91-275	Y	N	10/01/91	396	396	0	10/01/91	12/30/91		0	DM 55		
S-91203	WASTE SOLVENT	91-276	Y	N	10/01/91	0	110	110				0	DM 55		

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Nov, 1991

03JAN92:13

ACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY	DRUM VO	MANIF NO	MANIF DUE DATE
		ON SITE ACCUMULATION								DISPOSAL INFORMATION						
GS-91204	WASTE SOLVENT		N	N	10/01/91	0	110	110				0	DM	55		
GS-91205	WASTE SOLVENT		N	N	10/01/91	0	110	110				0	DM	55		
GS-91206	WASTE PAINT/SOLVENT		N	N	10/01/91	342	342	0	10/01/91	12/30/91		0	DM	55		
GS-91207	WASTE ALCOHOL		N	N	10/01/91	341	341	0	10/01/91	12/30/91		0	DM	55		
GS-91208	WASTE SOLVENT	91-280	Y	N	10/02/91	386	386	0	10/02/91	12/31/91		0	DM	55		
GS-91209	WASTE OIL		N	N	10/11/91	0	428	428	10/11/91	01/09/92		0	DM	55		
GS-91210	WASTE OIL		N	N	10/11/91	0	446	446	10/11/91	01/09/92		0	DM	55		
GS-91211	WASTE OIL		N	N	10/11/91	0	411	411	10/11/91	01/09/92		0	DM	55		
GS-91212	WASTE OIL		N	N	10/11/91	446	446	0	10/11/91	01/09/92		0	DM	55		
GS-91213	WASTE OIL/SOLVENTS		N	N	10/11/91	383	383	0	10/11/91	01/09/92		0	DM	55		
GS-91214	WASTE PAINT		N	N	10/24/91	110	440	330	11/25/91	02/23/92		0	DM	55		
GS-91219	GREASE	91-296	Y	N	11/11/91	0	325	325	11/11/91	02/09/92		0	DM	55		
GS-91220	WASTE SOLVENT	91-312	Y	N	11/14/91	0	230	230	11/14/91	02/12/92		0	DM	55		
GS-91221	WASTE SOLVENT		N	N	11/14/91	0	405	405	11/14/91	02/12/92		0	DM	55		
GS-91222	WASTE PAINT		N	N	11/25/91	0	325	325				0	DM	55		
TOTAL NGS						8583	12253	3670				0				

PREPARED BY: GORDON DAVIS APPROVED BY: BOB CANDELARIA

TOTAL NAVAJO GEN STATION	8583	12253	3670	0

GENERATOR STATUS=LARGE QUANTITY GENERATOR*

LL WEIGHTS ARE IN POUNDS

December Hazardous Waste Activities

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Dec, 1991

03JAN92:13

CILITY: NAVAJO GEN STATION

EPA-ID: AZD074452

ONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE
S CENTRAL STORAGE															
TOTAL NGS CENTRAL STORAGE						0	0	0				0			
-90089	MERCURY		N	N	11/30/90	20	20	0				0	DM 16		
-91001	WASTE SOLVENT		N	N	01/01/91	110	110	0				0	DM 55		
-91042	WASTE SOLVENT		N	N	03/25/91	330	330	0				0	DM 55		
-91052	WASTE SOLVENT		N	N	04/17/91	330	330	0				0	DM 55		
-91054	WASTE SOLVENT		N	N	04/22/91	220	330	110				0	DM 55		
-91055	WASTE SOLVENT		N	N	05/02/91	330	330	0				0	DM 55		
-91059	SOIL-SOLVENT CONTAM		N	N	05/06/91	20	20	0				0	DM 12		
-91140	WASTE SOLVENT		N	N	04/17/91	110	220	110				0	DM 55		
-91141	WASTE SOLVENT	91-251	Y	N	03/25/91	392	0	0	09/03/91	12/02/91	12/31/91	392	DM 55	91N16	02/04/92
-91143	WASTE SOLVENT	91-271	Y	N	05/13/91	400	0	0	10/01/91	12/30/91	12/31/91	400	DM 55	91N16	02/04/92
-91144	WASTE SOLVENT		N	N	05/02/91	110	404	294	12/04/91	08/30/92		0	DM 55		
-91147	WASTE SOLVENT	91-272	Y	N	05/31/91	318	0	0	10/01/91	12/30/91	12/31/91	318	DM 55	91N16	02/04/92
-91149	WASTE SOLVENT		N	N	06/07/91	220	220	0				0	DM 55		
-91167	GREASE		N	N	06/05/91	30	30	0				0	DM 12		
-91174	WASTE SOLVENT		N	N	07/19/91	220	220	0				0	DM 55		
-91184	WASTE SOLVENT	91-259	N	N	08/01/91	373	0	0	09/05/91	12/04/91	12/31/91	373	DM 55	91N16	02/04/92
-91190	WASTE SOLVENT		N	N	08/09/91	406	0	0	10/01/91	12/30/91	12/31/91	406	DM 55	91N16	02/04/92
-91192	GREASE	91-252	Y	N	09/03/91	236	0	0	09/03/91	12/02/91	12/31/91	236	DM 55	91N16	02/04/92
-91193	GREASE	91-253	Y	N	09/03/91	225	0	0	09/03/91	12/02/91	12/31/91	225	DM 55	91N16	02/04/92
-91194	GREASE	91-254	Y	N	09/03/91	341	0	0	09/03/91	12/02/91	12/31/91	341	DM 55	91N16	02/04/92
-91195	WASTE SOLVENT		N	N	09/03/91	110	110	0				0	DM 55		
-91196	WASTE PAINT		N	N	09/01/91	512	0	0	09/19/91	12/18/91	12/31/91	512	DM 55	91N16	02/04/92
-91197	GREASE		N	N	09/05/91	110	110	0				0	DM 55		
-91198	WASTE SOLVENT	91-273	Y	N	09/05/91	377	0	0	10/01/91	12/30/91	12/31/91	377	DM 55	91N16	02/04/92
-91199	WASTE SOLVENT		N	N	09/11/91	110	220	110				0	DM 55		
-91200	WASTE PAINT		N	N	09/21/91	427	0	0	10/21/91	01/19/92	12/31/91	427	DM 55	91N16	02/04/92
-91201	WASTE SOLVENT	91-274	Y	N	10/01/91	232	0	0	10/01/91	12/30/91	12/31/91	232	DM 55	91N16	02/04/92
-91202	WASTE SOLVENT	91-275	Y	N	10/01/91	396	0	0	10/01/91	12/30/91	12/31/91	396	DM 55	91N16	02/04/92
-91203	WASTE SOLVENT	91-276	Y	N	10/01/91	110	110	0				0	DM 55		

PREPARED BY:

APPROVED BY:

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Dec, 1991

03JAN92:13

CILITY: NAVAJO GEN STATION

EPA-ID: AZD074452

		ON SITE ACCUMULATION						DISPOSAL INFORMATION						
ONTAINER ID#	CONTENTS	ANLYS NUMBER	** PA	** AH	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE
S-91204	WASTE SOLVENT		N	N	10/01/91	110	330	220				0	DM 55		
S-91205	WASTE SOLVENT		N	N	10/01/91	110	110	0				0	DM 55		
S-91206	WASTE PAINT/SOLVENT		N	N	10/01/91	342	0	0	10/01/91	12/30/91	12/31/91	342	DM 55	91N16	02/04/92
S-91207	WASTE ALCOHOL		N	N	10/01/91	341	0	0	10/01/91	12/30/91	12/31/91	341	DM 55	91N16	02/04/92
S-91208	WASTE SOLVENT	91-280	Y	N	10/02/91	386	0	0	10/02/91	12/31/91	12/31/91	386	DM 55	91N16	02/04/92
S-91209	WASTE OIL		N	N	10/11/91	428	0	0	10/11/91	01/09/92	12/31/91	428	DM 55	91N16	02/04/92
S-91210	WASTE OIL		N	N	10/11/91	446	0	0	10/11/91	01/09/92	12/31/91	446	DM 55	91N16	02/04/92
S-91211	WASTE OIL		N	N	10/11/91	411	0	0	10/11/91	01/09/92	12/31/91	411	DM 55	91N16	02/04/92
S-91212	WASTE OIL		N	N	10/11/91	446	0	0	10/11/91	01/09/92	12/31/91	446	DM 55	91N16	02/04/92
S-91213	WASTE OIL/SOLVENTS		N	N	10/11/91	383	0	0	10/11/91	01/09/92	12/31/91	383	DM 55	91N16	02/04/92
S-91214	WASTE PAINT		N	N	10/24/91	440	0	0	11/25/91	02/23/92	12/31/91	440	DM 55	91N16	02/04/92
S-91219	GREASE	91-296	Y	N	11/11/91	325	325	0	11/11/91	02/09/92		0	DM 55		
S-91220	WASTE SOLVENT	91-312	Y	N	11/14/91	230	230	0	11/14/91	02/12/92		0	DM 55		
S-91221	WASTE SOLVENT		N	N	11/14/91	405	405	0	11/14/91	02/12/92		0	DM 55		
S-91222	WASTE PAINT		N	N	11/25/91	325	0	0	12/13/91	09/08/92	12/31/91	325	DM 55	91N16	02/04/92
S-91223	WASTE SOLVENT		N	N	12/04/91	0	110	110				0	DM 55		
S-91224	WASTE PAINT		N	N	12/13/91	0	110	110				0	DM 55		
S-91225	WASTE OIL/SOLVENTS		N	N	12/12/91	0	497	497	12/12/91	09/07/92		0	DM 55		
S-91226	WASTE OIL/SOLVENTS		N	N	12/12/91	0	367	367	12/12/91	09/07/92		0	DM 55		
TOTAL NGS						12253	5598	1928				8583			

PREPARED BY: GORDON DAVIS APPROVED BY: BOB CANDELARIA

TOTAL NAVAJO GEN STATION						12253	5598	1928				8583			

GENERATOR STATUS=SMALL QUANTITY GENERATOR*

L WEIGHTS ARE IN POUNDS

October, November, and December
Manifests

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. A Z D 0 7 4 4 5 2 4 2 6 — Manifest Document No. 9 1 1 N 1 4

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
SALT RIVER PROJECT NAVAJO GENERATING STATION
P.O. BOX W PAGE, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document Number

B. State Generator's ID 99904

5. Transporter 1 Company Name: CHEMICAL DISPOSAL CO. INC.
6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID 40158
D. Transporter's Phone 602-624-2348

7. Transporter 2 Company Name
8. US EPA ID Number

E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
ROLLINS ENVIRONMENTAL SERVICES INC .
2027 BATTLEGROUND RD.
DEER PARK, TX 77536
10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID 50089

H. Facility's Phone 713-930-2300

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, WASTE FLAMMABLE LIQUID, N.O.S., (1,1,1-TRICHLOROETHANE, TOLUENE), FLAMMABLE LIQUID, UN1993 (F001, F003, F005)	X	001	DM	00391	P	F001, F003, F005 910100
b.	RQ, WASTE FLAMMABLE LIQUID, N.O.S., (XYLENE), FLAMMABLE LIQUID, UN1993 (F003)	X	001	DM	00353	P	F003 910100
c.	RQ, WASTE FLAMMABLE LIQUID, N.O.S., (TOLUENE) FLAMMABLE LIQUID, UN1993 (F005)	X	001	DM	00216	P	F005 910100
d.							

J. Additional Descriptions for Materials Listed Above
11a., b., c. ERG GUIDE #27, ATTACHED

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
11a. RES HO 42593-37 (DRUM NO. NGS 91-063)
11b. RES HO 42593-37 (DRUM NO. NGS 91-181)
11c. RES HO 42593-37 (DRUM NO. NGS 91-182)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Gordon M. DAVIS		1	0	2	3	9	1

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Michael Holberg		1	0	2	3	9	1

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: A.Z.D.0.7.4.4.5.2.4.2.6 | Manifest Document No.: 9.1.N.1.6

2. Page 1 of 2

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document Number: № 00567259

B. State Generator's ID: 99904

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.

6. US EPA ID Number: A.Z.T.0.5.0.0.1.0.0.0.8

C. State Transporter's ID: 40138

D. Transporter's Phone: (602)624-2348

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T.X.D.0.5.5.1.4.1.3.7.8

G. State Facility's ID: 30089

H. Facility's Phone: (713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (Toluene, Xylene, 1,1,1-Trichloroethane), Flammable Liquid, UN 1993, (D007) (D008) (F001) (F003) (F005)	0 0 1	D M	0 0 3 8 6	P	D007, D008, F001, F003, F005, 910100
x	b. RQ, Waste Flammable Liquid, N.O.S., (Toluene, Xylene, 1,1,1-Trichloroethane), Flammable Liquid, UN 1993, (D008) (F001) (F003) (F005)	0 0 4	D M	0 1 7 3 1	P	D008, F001, F003, F005 910100
x	c. RQ, Waste Flammable Liquid, N.O.S., (Toluene, Xylene, 1,1,1-Trichloroethane), Flammable Liquid, UN 1993, D006) (D008) (F001) (F003) (F005)	0 0 1	D M	0 0 3 7 3	P	D006, D008, F001, F003, F005, 910100
x	d. RQ, Waste Flammable Liquid, N.O.S., (Toluene, Xylene, 1,1,1-Trichloroethane), Flammable Liquid, UN 1993, (F001) (F003) (F005)	0 0 4	D M	0 1 5 0 1	P	F001, F003, F005, 910100

J. Additional Descriptions for Materials Listed Above
11a, 11b, 11c & 11d. 55-gl steel drums
ERG Guide #17 attached
TELEPHONE NO. (602) 236-8305 (FOR EMERGENCY RESPONSE)

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Site: Page, AZ
11a. RES HO #42593-36 (Drum No. NGS 91208)
11b. RES HO #42593-36 (Drum Nos. NGS 91209 thru 91212)
11c. RES HO #42593-36 (Drum No. NGS 91184)
11d. RES HO #42593-36 (Drum Nos. NGS 91143, 91147, 91190 & 91198)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Gordon M. DAvis	Gordon M. Davis	12	31	91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
CRUZ ROBLES	[illegible]	12	31	91

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
		.	.	.

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
		.	.	.

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST *(Continuation Sheet)*

21. Generator's US EPA ID No.: AZD074452426

Manifest Document No.: 91N16

22. Page: 2 of 2

Information in the shaded areas is not required by Federal law.

23. Generator's Name
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040
(602) 645-8811

L. State Manifest Document Number: 00567259

M. State Generator's ID: 99904

24. Transporter 1 Company Name: Chemical Disposal Company, Inc.

25. US EPA ID Number: AZT050010008

N. State Transporter's ID: 40158

O. Transporter's Phone: (602) 624-2348

26. Transporter ___ Company Name:

27. US EPA ID Number:

P. State Transporter's ID:

Q. Transporter's Phone:

	28. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM	29. Containers No.	Type	30. Total Quantity	31. Unit Wt/Vol	R. Waste No.
a. e	RQ, Waste Flammable Liquid, N.O.S., (Toluene, Xylene), Flammable Liquid, UN 1993, (F003) (F005)	x	002	DM	00628	P	F003, F005, 910100
b. f	RQ, Waste Flammable Liquid, N.O.S., (Xylene, 1,1,1-Trichloroethane), Flammable Liquid, UN 1993, (F001)(F003)	x	001	DM	00383	P	F001, F003, 910100
c. g	RQ, Waste Flammable Liquid, N.O.S., (Methanol), Flammable Liquid, UN 1993, (F003)	x	001	DM	00341	P	F003, 910100
d. h	RQ, Waste Flammable Liquid, N.O.S., (Xylene), Flammable Liquid, UN 1993, (F003)	x	001	DM	00392	P	F003, 910100
e. i	RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F003)	x	005	DM	02046	P	F002, F003, 916940
f. j	RQ, Hazardous Waste Liquid, N.O.S., (Benzene) Xylene), ORM-E, NA 9189, (F003)(F005)	x	001	DM	00236	P	F003, F005, 990008
g. k	RQ, Hazardous Waste Liquid, N.O.S., (Xylene, 1,1,1-Trichloroethane), ORM-E, NA 9189, (F001)(F003)	x	002	DM	00566	P	F001, F003, 990008
h.							
i.							

S. Additional Descriptions for Materials Listed Above
28a, 28b, 28c & 28d. 55-gl steel drums - ERG Guide #27 attached
28e. 55-gl steel drum - ERG Guide #26 attached
28f & 28g. 55-gl steel drums - ERG Guide #31 attached

T. Handling Codes for Wastes Listed Above

32. Special Handling Instructions and Additional Information
28a, 28b, 28c & 28d. RES NO #42593-36 (Drum Nos. NGS 91201, 91202, 91213, 91207, 91141)
28e. RES NO #43151-36 (Drum Nos. NGS 91200, 91206, 91214, 91222 & NGS 91196)
28f & 28g. RES NO #45272-23 (Drum Nos. NGS 91192 thru 91194)
TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)
Site: Page, AZ

TRANSPORTER

33. Transporter ___ Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

34. Transporter ___ Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

35. Discrepancy Indication Space

90-Day Accumulation
Request and Approval

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

DEC 13 1991

In reply:
Refer to: (H-2-3)

Daniel J. Casiraro
Principal Staff Engineer
Salt River Project
P. O. Box 62025
Phoenix, AZ 85072-2025

Re: EPA ID NO. AZD074452426

Dear Mr. Casiraro:

This letter is in response to your request of December 2, 1991 for an extension of the 90 day hazardous waste storage limitation at Salt River Project at the above address.

After reviewing your request, I hereby grant a thirty (30) day extension in accordance with the provisions of 40 CFR, Part 262.34 (b), hazardous waste storage accumulation due to unforeseen, temporary and uncontrollable circumstances. This extension is effective as follows:

Drum numbers 91-141 and 91-192 through 91-194 are extended to January 1, 1992. Drum number 91-184 is extended to January 2, 1992. Drum number 91-196 is extended to January 17, 1992. Drum numbers 91-190; 91-207; 91-207 are extended to January 29, 1992.

These extensions do not alter your responsibility to otherwise comply with applicable requirements under the Resource Conservation and Recovery Act. I have granted this request based on information presented in your December 2, 1991 letter.

In addition, these extensions do not relieve you of your responsibility to comply with State and local requirements which may be more stringent that EPA regulations. For further information about State requirements you should contact California EPA, Department of Toxic Substances Control, 714 P Street, Sacramento, CA 95814, concerning their requirements.

If you have further questions you may contact Jeannie Paige of this office at (415) 744-2073.

Sincerely,

George Wilson for

Rich Vaille, P.E., Chief
State Programs Branch
Hazardous Waste Management Division

SALT RIVER PROJECT

POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

W&W-9517

VIA Facsimile

December 2, 1991

Mr. Rich Vaille
State Programs Branch
Office of Waste Programs
U.S. Environmental Protection Agency Region IX (H-2-2)
75 Hawthorne Street
San Francisco, CA 94105

RE: Navajo Generating Station Hazardous Waste Accumulation Extension Request

Dear Mr. Vaille:

Per my telephone conversation with you on December 2, 1991, the following request for a hazardous waste accumulation extension is being transmitted for Salt River Project's (SRP) Navajo Generating Station located near Page, Arizona.

SRP has been informed that the treatment, storage, or disposal facility (TSDF) utilized for destructive incineration is not accepting wastes for about a four week period or longer. The TSDF is Rollins Environmental Services located in Deer Park, Texas. Rollins has experienced electrical outages which caused the afterburner scrubber units to burn. Thus, the facility is shut-down for a period of at least four weeks (see attached letter from Rollins). Therefore, SRP requests a 30-day accumulation extension for the materials that will exceed the 90-day accumulation period. The description of the hazardous waste materials is found on Table I.

Should a question arise regarding this matter, please call me at (602) 236-2811.

Sincerely,

Daniel J. Casiraro

Daniel J. Casiraro
Principal Staff Engineer
Environmental Management Services

DJC:dg
Attachments

TABLE I

EPA I.D. No.	*Contents*	*Container Quantity and Type*	*90th Day*	I.D.
AZD074452426	Solvent	392 lb. drum	12/02/91	91-141
	Grease	236 lb. drum	12/02/91	91-192
	Grease	225 lb. drum	12/02/91	91-193
	Grease	341 lb. drum	12/02/91	91-194
	Solvent	373 lb. drum	12/04/91	91-184
	Paint	512 lb. drum	12/18/91	91-196
	Solvent	406 lb. drum	12/30/91	91-190
	Paint	342 lb. drum	12/30/91	91-206
	Alcohol	341 lb. drum	12/30/91	91-207

ROLLINS
ENVIRONMENTAL SERVICES (SALES) INC.

P.O. Box 609, Deer Park, TX 77536, 713/930-2300, FAX 713/930-2334

November 19, 1991

Mr. Mike Bleck
SALT RIVER PROJECT
P.O. Box 52025
Phoenix, AZ 85072-2025

Dear Mr. Bleck:

As you may be aware we recently encountered a problem at our Rollins Environmental Services (TX) Inc. incineration facility located in Deer Park, TX. Following is the press release concerning this incident:

> During a severe thunder and lightning storm, a fire occurred at approximately 3:00 p.m. CST, Sunday, November 17, 1991, at the Rollins Environmental Services subsidiary facility at Deer Park, Texas, due to elevated temperatures in the fiberglass lined air pollution control equipment. The fire was limited to the air pollution control equipment and was brought under control and extinguished in approximately two hours. There were no injuries or harm to the environment. The Company is assessing the damage and commencing a full investigation into the cause. At this time, early estimates are for repairs to take at least 4 weeks before operations are restored to normal. The Company is insured for both property damage and business interruption.

It is our intent to resume full service to you as soon as possible. As new information is derived from the investigation we will contact you to discuss the opportunity for service again. In the mean time should you require more information please contact your Account Executive or Customer Service Representative.

We value the relationship between our two companies and thank you for your business.

Sincerely,

ROLLINS ENVIRONMENTAL SERVICES (SALES) INC.

KLL

Kenneth L. Lark
Regional Sales Manager

KLL/ld

RCRA COMPLIANCE DATA

FACILITY	TASK	DATE DUE	DATE RECEIVED	COMPLIANCE OFFICER	RESOLUTION
SALT RIVER PROJECT NGS	SUBMIT SAMPLING & ANALYSIS PLN PT A	02/04/91	02/04/91	GARTIES	UNDER REVIEW
SALT RIVER PROJECT NGS	SUBMIT SANPLING & ANALYSIS PLN-PT B	03/05/91	03/06/91	GARTIES	REVIEWING PLANS
SALT RIVER PROJECT NGS	COMMENCE SAMPLING & ANALYSIS	05/06/91	07/17/91	RAJAGOPALA	W/IN 60 DYS OF PLN APPROV
SALT RIVER PROJECT NGS	SUBMIT SAMPLING & ANALYSIS RESULTS	10/17/91	10/17/91	RAJAGOPALA	W/IN 90 DYS OF COMMENCEMT
SALT RIVER PROJECT NGS	SUBMIT INVESTIGATION REPORT	10/17/91	10/17/91	RAJAGOPALA	W/IN 90 DYS OF COMMENCEMT
SALT RIVER PROJECT NGS	SUBMIT REMEDIATION PLAN IF NEC.	10/17/91	10/17/91	RAJAGOPALA	PLAN NOT NECESSARY
SALT RIVER PROJECT NGS	SUBMIT OPERATING PROCEDURES	02/04/91	02/04/91	GARTIES	UNDER REVIEW
SALT RIVER PROJECT NGS	SUBMIT CONFIRMATION OF PART A	02/04/91	02/04/91	GARTIES	
SALT RIVER PROJECT NGS	SUBMIT 1ST QUARTERLY RPT ON HW GEN	04/04/91	04/05/91	RAJAGOPALA	
SALT RIVER PROJECT NGS	SUBMIT 2ND QUARTERLY RPT ON HW GEN	07/04/91	07/04/91	RAJAGOPALA	
SALT RIVER PROJECT NGS	SUBMIT 3RD QUARTERLY RPT ON HW GEN	10/04/91	10/04/91	RAJAGOPALA	
SALT RIVER PROJECT NGS	SUBMIT 4TH QUARTERLY RPT ON HW GEN	01/04/92	01/04/92	RAJAGOPALA	
SALT RIVER PROJECT NGS	PAY PENALTY OF $113,500	02/04/91	02/01/91	GARTIES	WIRED TO FRC
SALT RIVER PROJECT NGS	GER VIOLATION RTC	03/04/91	03/04/91	RAJAGOPALA	
SALT RIVER PROJECT NGS	IN COMPLIANCE WITH CA/FO	04/08/94	04/08/94	RAJAGOPALA	

PRC Environmental Management, Inc.
120 Howard Street
Suite 700
San Francisco, CA 94105
415-543-4880
Fax 415-543-5480

PRC

December 6, 1991

Ms. Latha Rajagopalan
Work Assignment Manager
U.S. EPA Region 9
75 Hawthorne Street, H-2-2
San Francisco, CA 94105

Contract No. 68-W9-0009
Work Assignment No. R09030

Subject: Technical Review of the *Soil and Groundwater Investigation for Determining Potential Chromium Contamination Final Report* (October 1991)
Navajo Generating Station, Page, Arizona

Dear Ms. Rajagopalan:

This letter report provides a technical review of the *Soil and Groundwater Investigation for Determining Potential Chromium Contamination Final Report*, dated October 1991, that was submitted to the U.S. Environmental Protection Agency (EPA) by the Salt River Project (SRP). The investigation report summarizes the findings of field investigations conducted during July 1991 at the Navajo Generating Station (NGS) located near Page, Arizona, as well as laboratory analyses to determine the chromium concentrations of soil and ground-water samples collected during the sampling event.

Background information on NGS is presented below, followed by a technical review of the investigation report and recommendations.

BACKGROUND

NGS is a 2,235-megawatt coal-fired power plant located about 4 miles southeast of Page, Arizona. The plant is operated by SRP, which is also a part owner of the facility. An EPA inspection of NGS during 1988 documented that at least four releases of bearing cooling water (BCW) containing sodium bichromate, a corrosion-inhibiting additive, had occurred between 1982 and 1988. On each occasion, approximately 50,000 gallons of BCW containing an estimated 500 to 800 milligrams per liter (mg/l) of sodium bichromate ($Na_2Cr_2O_7$) was drained from an aboveground tank to a concrete-lined culvert during maintenance operations. The cooling water then passed through an unlined earthen ditch to two plastic-lined surface impoundments. Chromium contamination of the soil in the unlined ditch is believed to have occurred during each release.

A 3008(a) Consent Agreement and Final Order (CA/FO) between SRP and EPA requires that SRP conduct soil and ground-water sampling at NGS to determine the extent and magnitude of chromium contamination. The CA/FO also established the following health-based exposure levels for chromium: 400 milligrams per kilogram (mg/kg) of total chromium in soil and 0.05 mg/l of hexavalent chromium in ground water. In addition to the investigation report, SRP was to provide either (1) a certification that the closure performance standards in 40 Code of Federal Regulations (CFR) 265.111 can be met or (2) a draft remediation plan designed to ensure that SRP will be able to meet the closure performance standards. The field investigation was carried out by SRP and its contractor, Brown and Caldwell (BC), during July 1991. The results of laboratory analysis for chromium are presented in the investigation report.

TECHNICAL REVIEW OF INVESTIGATION REPORT

The soil and ground-water investigation performed by SRP and BC was conducted in a well-organized and professional manner, as verified by PRC during its oversight of field activities. Techniques used during the field investigation closely followed those proposed in the SRP Sampling and Analysis Plan (SAP), dated May 1991. Minor modifications were necessary due to unexpected field conditions. For example, refusal of the split-spoon sampler occurred at depths less than 2 feet in the borings within the S-14 Impoundment (Area B) due to the presence of lithified sandstone of the Carmel Formation. Thus, only 14 samples were collected from Area B, rather than the 20 samples proposed in the SAP. Variances from the procedures outlined in the SAP were discussed with EPA and PRC during the oversight visit, and were subsequently documented in a letter from SRP to EPA dated August 1, 1991. None of these variances are believed to have compromised the integrity of the samples collected or the investigation as a whole.

Soil samples were collected from a total of 92 locations, including 6 background samples. The soil samples were collected using a hollow-stem auger rig and split-spoon sampler. The distribution of sampling locations was as follows:

Area	Location	Number of Samples
A	West Plant Drainage	19
B	S-14 Impoundment	14
C	Soil Accumulation Area	8
D	Coal Pile Terrace	8
E	Ash Disposal Area (Site 1)	14
E	Ash Disposal Area (Site 2)	23
	Background Areas	6
	Total	92

The rationale for the locations and number of samples is detailed in the SAP. Samples from Area E (Ash Disposal Area, Sites 1 and 2) were combined into eight composite samples, as described in the SAP, so that a total of only 63 soil samples were submitted for laboratory analysis, not including duplicates and quality assurance/quality control (QA/QC) samples.

In addition to the soil samples, ground-water samples were collected from five wells, including one background well (MW-66) located away from the areas of concern. Four of the ground-water samples were collected from existing monitoring wells, and two were collected from wells installed during the course of this investigation. An additional three new monitoring wells were installed, but yielded insufficient water to sample.

As described in the SAP, soil samples were analyzed for total chromium using EPA Methods 3050/6010 (acid extraction/ICP). Ground-water samples were analyzed for hexavalent chromium using EPA Method 7196 (colorimetric). Enseco (Garden Grove, California) performed the soil analyses and Westech Laboratories (Phoenix, Arizona) performed ground-water analyses.

Concentrations of total chromium in soil ranged from <1 mg/kg to a high of 324 mg/kg. Concentrations of hexavalent chromium determined for ground-water samples ranged from <0.05 mg/l to 1.2 mg/l. All samples were analyzed within the recommended holding times, and analytical precision and accuracy, as reflected by QA/QC sample results, indicate that the laboratory data are valid and representative of site conditions. The only problem noted in the investigation report with respect to field procedures or laboratory results is an error in the reported concentration of hexavalent chromium for the field blank (Table 6-3, p. 6-8). The concentration of hexavalent chromium should be <0.05 mg/l, not <0.5 mg/l as reported. Aside from this typographical error, no other technical problems were found in the reported analytical results. It should be noted, however, that raw laboratory data and bench sheets were not available for review by PRC. Thus, the assessment of the data quality is based solely on the final laboratory results for field samples and QA/QC samples.

All of the soil samples were found to contain less than the established exposure level of total chromium (400 mg/kg). Although the values did not exceed this action level, clear patterns exist in the spatial distribution of chromium in the soil surrounding NGS. The highest concentrations were detected in the thin (< 1-foot thick) sediment layer overlying the plastic liner in the abandoned S-14 Impoundment (Area B), and in the soil underlying the liner. Measured values of total chromium in the sediment from the S-14 Impoundment range from 68.4 to 324 mg/kg, as compared to background soil concentrations of 1.8 to 3.8 mg/kg. The elevated chromium concentrations in the S-14 Impoundment are almost certainly the result of the disposal of BCW into the West Plant Drainage, which emptied into the impoundment. Soil samples from Areas A and E show only slightly elevated concentrations of total chromium. Soil samples from Areas C and D contained only background concentrations of total chromium.

Only one of the five ground-water samples contained hexavalent chromium above the laboratory detection limit. The sample from MW-71 (sample GW-04) was found to contain 1.2 mg/l of hexavalent chromium. This value is 24 times higher than the exposure level of 0.05 mg/l, which is based on the drinking water Maximum Contaminant Level (MCL). The perched ground water in this well has clearly been contaminated with the BCW.

SRP concluded that no further action or investigation is necessary based upon the following observations:

- None of the soil samples exceeded the exposure level for total chromium in soil (400 mg/kg).
- Only one of the ground-water samples exceeded the exposure level for hexavalent chromium in water (0.05 mg/l).
- The shallow "aquifer" in the Carmel Formation is perched and is separated from the underlying Navajo Sandstone regional aquifer by approximately 900 feet of unsaturated (dry) sandstone. Furthermore, the shallow Carmel aquifer is of very limited lateral extent.
- Because of its great depth, the Navajo Sandstone aquifer is not known to be used as a water supply at present in the vicinity of the facility.

RECOMMENDATIONS

Figure 1 shows a plot of total chromium concentrations for all of the discrete soil samples (not including composited samples from Area E). Figure 2 shows the frequency distribution of the soil chromium values. It is evident from the bimodal distribution of values in Figure 2 that there are two groups of soils present at NGS: uncontaminated soils with total chromium concentrations less than 100 mg/kg, and contaminated soils with total chromium concentrations in excess of 100 mg/kg. Although the total chromium analyses performed on the soil samples would include both hexavalent and trivalent species, it is likely that the chromium in the sediments and soil in Areas A and B is present predominantly in the form that it was released to the environment, that is as salts of hexavalent chromium. Two pieces of evidence suggest this: (1) a significant concentration of hexavalent chromium exists in the ground water sampled in MW-71, indicating that dissolved hexavalent chromium can pass through the soil to the perched water table as chromate or dichromate ion without being reduced to insoluble trivalent chromium and precipitating and (2) soils of the southwestern United States are generally strongly oxidizing[1], and lack the necessary amounts of organic matter required to reduce hexavalent chromium (Cr^{6+}) to trivalent chromium (Cr^{3+}). Thus, the measured values for total chromium in the soil samples are probably approximately equal to the hexavalent chromium content.

Given the small areal extent of the Carmel Formation aquifer in the vicinity of NGS (Figure 6, Appendix A), PRC agrees with SRP's assertion that it is unlikely that the shallow perched ground water is migrating laterally offsite. Likewise, the probability for significant downward migration of the contaminated shallow ground water is minimal, due to the apparent low permeability of the lower Carmel Formation beds that have allowed perched conditions to exist. However, since hexavalent chromium contamination of the shallow aquifer and soils has now been documented, albeit at concentrations generally below the exposure levels in the CA/FO, PRC concludes:

- The extent and magnitude of chromium contamination in the soils due to past releases of BCW have been adequately defined by this study; therefore, no further soil investigations are needed.

- SRP should continue to monitor hexavalent chromium in the shallow monitoring wells on a quarterly basis, in order to determine if migration is occurring and to better establish baseline contaminant concentrations. In addition, the three existing deep monitoring wells (GSMWNADW-1, -2, and -3) screened in the Navajo Sandstone should be monitored for hexavalent chromium to ensure that contaminants have not reached the deep aquifer. Copies of the results of the quarterly sampling and analysis should be forwarded to EPA.

- SRP should attempt to determine the locations, depths, and present status of all water supply wells, if any, within 1 mile of the facility. This information will lend credibility to SRP's claim that the shallow chromium-contaminated ground water underlying NGS is not a threat to nearby residents.

---

[1] Robertson, F.N., 1975, *Hexavalent Chromium in the Ground Water in Paradise Valley, Arizona, Ground Water*, v. 13, no. 6, December 1975

These recommendations represent a reasonable and inexpensive compromise between no action and initiation of corrective measures. The establishment of a post-closure monitoring program would satisfy the intent of the CA/FO requirement that appropriate closure performance standards have been met.

As we discussed over the telephone, Barbara Sootkoos will replace me as PRC's Project Manager on this work assignment. If you have any questions regarding this review, you may reach her at (415) 543-4880 or me at (505) 822-9400. It has been a pleasure working with you on this project.

Sincerely,

Barbara Sootkoos

for Jeffrey Forbes
PRC Project Manager

Enclosures (2)
cc: Barbara Sootkoos, PRC
File

Figure 1

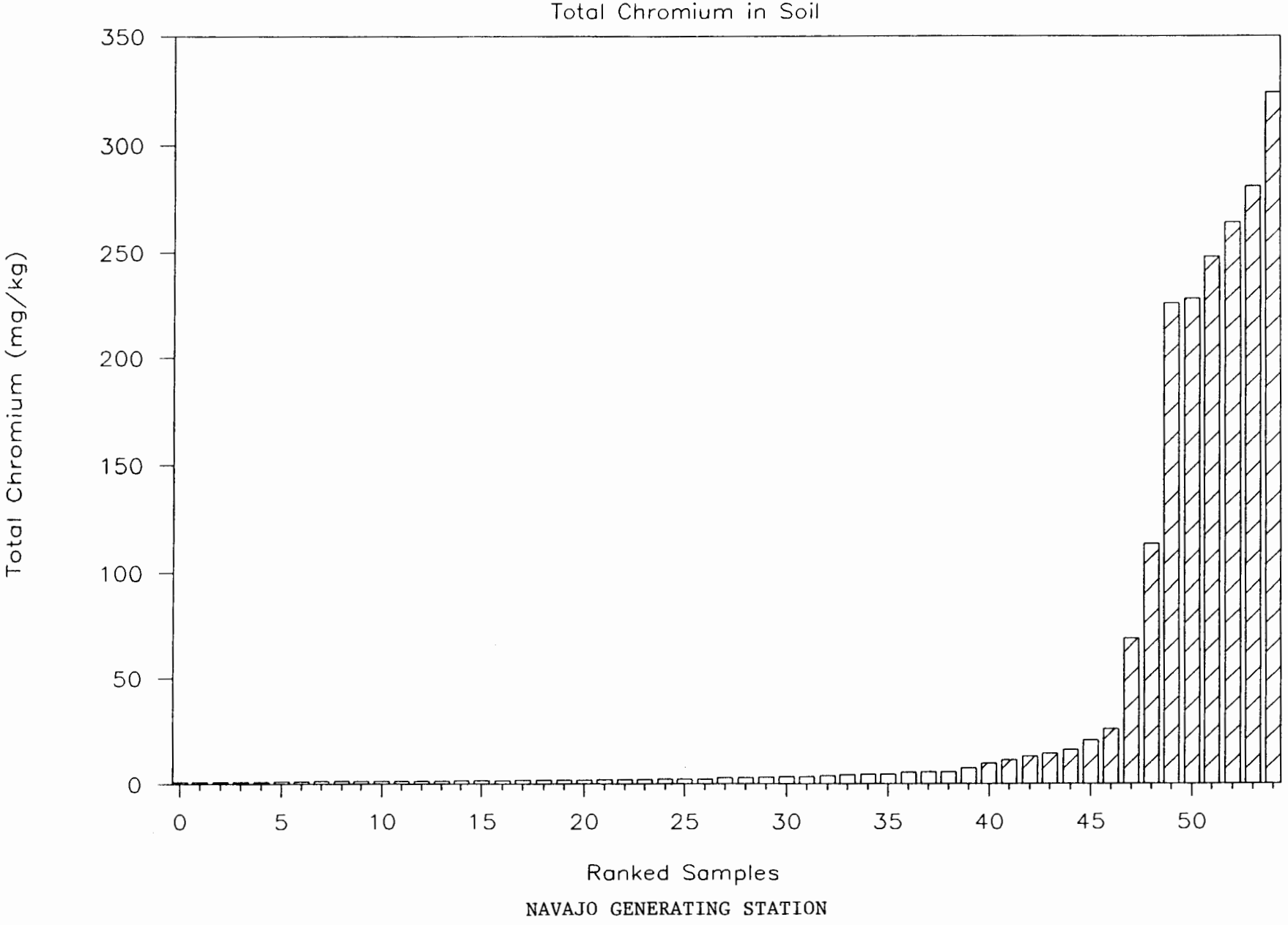
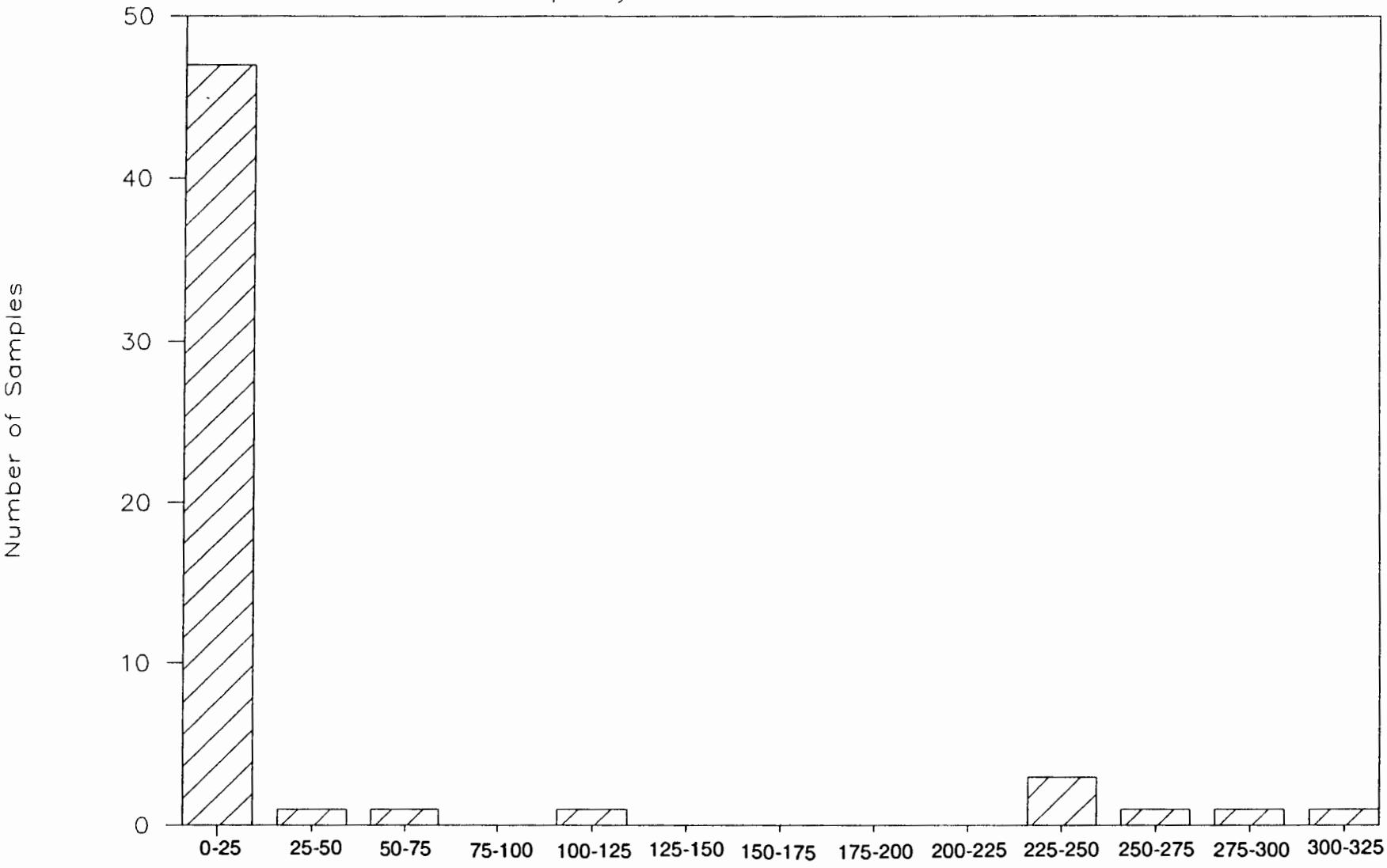

Total Chromium in Soil
350
300
250
200
150
100
50
0
Total Chromium (mg/kg)
0
5
10
15
20
25
30
35
40
45
50
Ranked Samples
NAVAJO GENERATING STATION

Figure 2

Frequency of Total Chromium in Soil



NAVAJO GENERATING STATION

PGM : TFO16RPTO0114-02 DAILY SUPPORT LISTING OF FDS DEPOSITS PAGE 1
AS-OF: 02/01/91 AT 21:53 FOR 02/01/91

ALC 68011009 ENVIRONMENTAL PROTECTION AGCY.
REGION IX
215 FREMONT STREET
SAN FRANCISCO, CA 94105

ASG NO.	MESSAGE TEXT	AMOUNT
02-01-001019	TO: 021030004 TYPE: 1040 SPEC HANDLE:	
	FROM: 122100024 REF: 1255	
	SEND: VALLEY PHNX /ORG=SALT RIVER PROJECT	$ 113,500.00
	RECV: TREAS NYC /CTR/BNF=/AC-68011009	
	CMNT: OBI=EPA ENVIRONMENTAL PROTECTION AGENCY	
	DOCKET #RCRA09-90-0001	
	IMAD: 0201 L2LFVP1C 000507 02011633 FT1L URC: OMAD: 0201 B1QFD01A 000928 02011633 FT1B	

*** DAILY TOTAL *** CONFIRMED DATE 02/01/91 DEPOSIT TICKET NUMBER 691935 $ 113,500.00

MESSAGES PROCESSED TODAY 1

MESSAGES IMPROPERLY FORMATTED / CORRECTED 0

RECEIVED
FEB 12 1991
Office of Comptroller
U. S. EPA, Region 9

STANDARD FORM 215C (12-87)
PRESCRIBED BY DEPT. OF TREASURY

DEPOSIT TICKET

DEPARTMENT OF THE TREASURY
FINANCIAL MANAGEMENT SERVICE

(1) DEPOSIT NUMBER	(2) DATE PRESENTED OR MAILED TO BANK M M D D Y Y	(3) 8-DIGIT ACCGENCY ACCOUNTING STATION CODE OR 4-DIGIT DISBURSING OFFICE SYMBOL	(4) AMOUNT	(5) DATE CONFIRMED M M D D Y Y
691935	0 2-0 1-9 1	6 8 0 1 1 0 0 9	113,500.00	0 2-0 1-9 1

(6) AGENCY USE

THIS DOCUMENT WAS GENERATED BY THE FEDWIRE DEPOSIT SYSTEM.
SEE DAILY SUPPORT LISTING OF FDS DEPOSITS.

(7) NAME AND ADDRESS OF DEPOSITARY

U[illegible]REASURY DEPARTMENT FIN. MAN.
S[illegible]ICE HYATTSVILLE, MD 20782

(8) I CERTIFY THAT THE ABOVE AMOUNT HAS BEEN RECEIVED FOR CREDIT IN THE ACCOUNT OF THE U.S. TREASURY ON THE DATE SHOWN SUBJECT TO ADJUSTMENT OF UNCOLLECTIBLE ITEMS INCLUDED THEREIN

MANAGER
FINANCIAL ADJUSTMENT BRANCH

(9) DEPOSITARY DATE STAMP, AND RETURN THIS CONFIRMED COPY TO DEPOSITOR

(9) DEPOSITORS TITLE, DEPARTMENT OR AGENCY AND ADDRESS

ENVIRONMENTAL PROTECTION AGCY.
REGION IX
215 FREMONT STREET
SAN FRANCISCO, CA 94105

(10) OFFICIAL USE ONLY

RECEIVED
FEB RECEIVED
FEB 12 1991
Office of Comptroller
U.S. EPA

ARIZONA DEPARTMENT OF HEALTH SERVICES

GENERATOR ANNUAL HAZARDOUS WASTE REPORT FOR 1986

RECEIVED APR 10 1987 ADHS-OWWQM

I. NON-REGULATED STATUS

Complete this section only if you did not generate regulated quantities of hazardous waste at any time during the 1986 calendar year. Circle the one code at right that best describes your status during the entire year (see instructions for explanation of codes).

1 Non-handler
2 Small Quantity Generator
4 Exempt
9 Out of Business

II. GENERATOR'S USEPA ID NUMBER

AZD 074452426

This Installation's Non-Regulated Status is Expected to Apply:

_____ For 1986 Only
_____ Permanently
_____ Other _____

III. NAME OF ESTABLISHMENT

SALT RIVER PROJECT NAVAJO GENERATING STATION

IV. ESTABLISHMENT MAILING ADDRESS

Street or P.O. Box: PO BOX 52025 ENVIRON SVC

City or Town: PHOENIX

County: MARICOPA State: AZ Zip: 85072

V. LOCATION OF ESTABLISHMENT (If different from Section IV above)

Street or Route No.: 5 MILE POST 98 HWY

City or Town: PAGE

County: COCONINO State: AZ Zip: 86040

VI. ESTABLISHMENT CONTACT

Name (Last, First): SULTANA, DAVID

Phone Number (Area code and no.): 602-236-2778

VII. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print/Type Name	Title	Signature	Date
Leroy Michael, Jr.	Associate General Manager Planning & Resources	Leroy Michael	April 9, 1987

ARIZO. DEPARTMENT OF HEALTH SER.ICES

GENERATOR ANNUAL HAZARDOUS WASTE REPORT FOR 1986 (cont.)

VIII. GENERATOR'S USEPA ID NO. AZD074452426

IX. FACILITY NAME

Chemical Waste Management

X. FACILITY'S USEPA ID NO.

CAT000646177

XI. FACILITY ADDRESS

35251 Old Skyline Rd,
Kettleman City, CA 93239

XII. TRANSPORTER(S) USED

Chemical Waste Management
2301 W. Broadway Rd.
Phoenix, AZ 85041

AZT050010180

XIII. WASTE IDENTIFICATION

	A	B	C		D	E
	DESCRIPTION OF WASTE	DOT CODE	USEPA WASTE NO.		AMOUNT OF WASTE	U/M
1	Waste Flammable Liquid, n.o.s., UN 1993	08	F001	F003	7252	P
			F005			
2	Waste Alkaline Liquid, n.o.s., NA 1719	02	D002		529	P
3						
4						
5						
6						
7						
8						

XIV. COMMENTS(enter information by section number - see instructions)

Section XIII, items 1 through 2:- We believe all or most of this waste was generated in 1985, but our records are not complete enough to determine this with accuracy. Therefore, because some of the waste may have been generated in 1986, we are reporting this shipment.

ARIZONA DEPARTMENT OF HEALTH SERVICES

GENERATOR ANNUAL HAZARDOUS WASTE REPORT FOR 1986 (cont.)

VIII. GENERATOR'S USEPA ID NO. AZD074452426

IX. FACILITY NAME
ENSCO, Inc.

X. FACILITY'S USEPA ID NO.
ARD069748192

XI. FACILITY ADDRESS
AMERICAN ROAD
EL DORADO, AR 71730

XII. TRANSPORTER(S) USED
Chemical Disposal Co.
11115 N. Casa Grande Highway
Rillito, AZ 85654
AZT050010008

XIII. WASTE IDENTIFICATION

	A DESCRIPTION OF WASTE	B DOT CODE	C USEPA WASTE NO.	D AMOUNT OF WASTE	E U/M
1	Waste Flammable Liquid, n.o.s., UN 1993	08	F001 F003 F005	9592	P
2					
3					
4					
5					
6					
7					
8					

XIV. COMMENTS(enter information by section number - see instructions)

Section XIII, item 1: over 1,000 kg may have been accumulated on-site for longer than 90 days. (See Addendum).

ARIZONA DEPARTMENT OF HEALTH SERVICES

GENERATOR ANNUAL HAZARDOUS WASTE REPORT FOR 1986 (cont.)

VIII. GENERATOR'S USEPA ID NO. AZD074452426

IX. FACILITY NAME

X. FACILITY'S USEPA ID NO.

XI. FACILITY ADDRESS

XII. TRANSPORTER(S) USED

XIII. WASTE IDENTIFICATION

	A DESCRIPTION OF WASTE	B DOT CODE	C USEPA WASTE NO.	D AMOUNT OF WASTE	E U/M
1	Omala Oil Sludge n.o.s., NA 9189		D004	390	P
2					
3					
4					
5					
6					
7					
8					

XIV. COMMENTS(enter information by section number - see instructions)

GEN. USEPA ID NO.: AZD 074452426
Salt River Project - NGS

XIV. COMMENTS

Section XIII, item 1: This waste was generated in 1986 and has not yet been disposed off-site. Over 1,000 kg (when this waste is considered with the waste on page 3, Section XIII, item 1) may have been accumulated on-site for longer than 90 days. (See Addendum).

ARIZONA DEPARTMENT OF HEALTH SERVICES

GENERATOR ANNUAL HAZARDOUS WASTE REPORT FOR 1986 (cont.)

XV. GENERATOR'S USEPA ID NO. | A | Z | D | 0 | 7 | 4 | 4 | 5 | 2 | 4 | 2 | 6 |

XVI. WASTE MINIMIZATION (narrative description)

Under the assumption that we were a small quantity generator in 1986, SRP did not have a formal waste minimization program in place. SRP is developing such a program for 1987.

ARIZONA DEPARTMENT OF HEALTH SERVICES

GENERATOR ANNUAL HAZARDOUS WASTE REPORT FOR 1986 - ADDENDUM

XVIII. GENERATOR'S USEPA ID NO.

A C D 0 7 4 4 5 2 4 2 6

XIX. GENERATOR NAME AND ADDRESS

Salt River Project - NGS
P O Box 52025
Phoenix, AZ 85072

XX. TOTAL WASTE IN STORAGE

	AMOUNT OF WASTE	U/M
S01	9 9 8 2	P
S02		
S03		
S04		
S05		

XXI. WASTE IDENTIFICATION AND MANAGEMENT

	A DESCRIPTION OF WASTE	B MGT METH	C USEPA WASTE NO.		D AMOUNT OF WASTE	E U/M
1	Waste Flammable Liquid, n.o.s., UN 1993	S 0 1	F 0 0 1 F 0 0 5	F 0 0 3	9 5 9 2	P
2	Omalo Oil Sludge, n.o.s., NA 9189	S 0 1	D 0 0 4		3 9 0	P
3						
4						
5						
6						
7						
8						

XXII. COMMENTS(enter information by section number - see instructions)

Section XXI, items 1 through 2: waste reported on this Addendum is waste generated in 1986 that may have been accumulated on-site in excess of 1,000 kg for longer than 90 days.

CONVERSATION R ORD

TIME 10:00 | ATE 11/27

TYPE ☐ VISIT ☐ CONFERENCE ☒ TELEPHONE ☐ INCOMING ☐ OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	ORGANIZATION (Office, dept., bureau, etc.)	TELEPHONE NO.
Louise Linkin	Navajo EPA	602 871-6617

SUBJECT CA/FO between SRP & EPA

ROUTING	
NAME/SYMBOL	INT

SUMMARY Called to inform N.E.P.A. of upcoming signing of CA/FO w/ SRP resolving last years Order for Navajo Generating Station. Outlines basic compl. + penalty in CA/FO

Pls contact N.E.P.A. instead of "Acting Director" because old gov't out of power, transition period now, new gov't not till Jan.

Press officer fired last week - don't know if new one

Gallup Independent Navajo Times

Albuquerque Times

ACTION REQUIRED

602 871-5704 Justice Dept
871-2297 Navajo EPA

FAX Draft CA/FO to L.L. at N.E.P.A.

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
P. Gaviles	PG	11/28/96

ACTION TAKEN

SIGNATURE	TITLE	DATE

ocation of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	ORGANIZATION (Office, dept., bureau, etc.)	TELEPHONE NO:	
Louise Linkin (Acting Director) ~~(Navajo EPA)~~	Navajo EPA	(602) 871-6422 (3)	Rocceena Lauth

SUBJECT

Salt River Project - Navajo Generating Station

SUMMARY

Called to advise N.E.P.A. that R.9 has sent administrative order with penalties to Navajo Generating Station/Salt River Project. Order is for RCRA violations: draining chromium-contaminated water into surface impoundments (disposal) w/out permit or notification; Storing drums of haz. waste for over 90 days w/out permit or notif. Copy of order has already been sent, press release will be sent when releas

REDACTED

NON-RESPONSIVE

REDACTED

ACTION REQUIRED

Send press release.

REDACTED/NON-RESPONSIVE NON-RESPONSIVE

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Peggy Garties	Peggy Garties	11/28

ACTION TAKEN

Left message for Greg Grajowski 11/29/89.
Left message for Mary Grisier 12/13. Note to Mary Grisier 12/19

SIGNATURE	TITLE	DATE
Peggy Garties	EPS	12/19

50271-101 ☆U.S. G.P.O. 1983-381-526/8348

CONVERSATION RECORD

OPTIONAL FORM 271 (12-76) DEPARTMENT OF DEFENSE

SALT RIVER PROJECT
POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

W&W-9492

Overnight Mail

October 3, 1991

Ms. Lahta Rajagoplan
Compliance Officer
U.S. Environmental Protection Agency
Region IX (H-2-2)
75 Hawthorne Street
San Francisco, CA 94105

RE: Navajo Generating Station RCRA Docket #09-90-0001 - Consent Agreement and Final Order (CA/FO)

Dear Ms. Rajagoplan:

Pursuant to the requirement of the CA/FO, enclosed is the quarterly report for the Salt River Projects' (SRP) Navajo Generating Station. The quarterly report consists of the monthly hazardous waste activities for the months of July, August, and September of 1991.

The report identifies the amount and types of hazardous waste generated, the dates accumulation began, the name of the TSD to which the waste was shipped, the dates the waste was shipped, and copies of accompanying manifests (manifest document numbers 91N10, 91N11, and 91N13; manifest 91N12 was a PCB shipment and is not included in this report).

If there are any questions regarding this report, please contact me at (602) 236-2811.

Sincerely,

Daniel J. Castraro
Principal Staff Engineer
Environmental Management Services

DJC:dg
Enclosures

July, August and September
Manifests

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039 expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. A Z D 0 7 4 6 5 2 4 2 6 | Manifest Document No. 9 1 9 6

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. box W, Page, AZ 86040

A. State Manifest Document Number
№ 00503351

B. State Generator's ID
99904

4. Generator's Phone (602) 645-8811

5. Transporter 1 Company Name
Chemical Disposal Company, Inc.

6. US EPA ID Number
A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID 40158

D. Transporter's Phone (602) 624-2348

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number
T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID
50089

H. Facility's Phone
(713) 930-2300

11A HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Toluene), Flammable Liquid, UN 1993, (F001)(F003)(F005)	002	DM	00742	P	F001, F003, F005, 910100
x	b. RQ, Hazardous Waste Liquid, N.O.S., (1,1,1-Trichloroethane, Toluene, ORM-E, NA 9189, (F001)(F005)	017	DM	03971	P	F001, F005, 990008
x	c. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Xylene), Flammable Liquid, UN 1993, (F001)(F003)(F005)	001	DM	00375	P	F001, F003, F005, 910100
x	d. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F003)	001	DM	00423	P	F002, F003, 916940

J. Additional Descriptions for Materials Listed Above
11c. RES HO #42593-37 (Drum No. NGS 91148)
11d. RES HO #43151-37 (Drum No. NGS 91056)
11a & 11c - ERG Guide #27 attached
11b - ERG Guide #31 attached 11d - ERG Guide #26 attached

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Site: Page, AZ
11a. RES HO #42593-37 (Drum Nos. NGS 91062 & 91064)
11b. RES HO #45272-23 (Drum Nos. NGS 91058, 91060, 91072, 91078 thru 91083, 91085 thru 91087, 91089, 91090, 91093 thru 91095
TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
Douglas C Laughlin	Douglas C. Laughlin	10 7 19

17. Transporter 1 Acknowledgement of Receipt of Materials — Date

Printed/Typed Name	Signature	Month Day Year
CRUZ DOBLES		10 7 19

18. Transporter 2 Acknowledgement of Receipt of Materials — Date

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date Month Day Year

GENERATOR
TRANSPORTER
FACILITY

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: A Z D 0 7 4 4 5 2 4 2 6 — Manifest Document No.: 8/NV/3
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address:
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.
6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address:
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

11A. HM	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
X	a. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Toluene), Flammable Liquid, UN 1993, (F001)(F003)(F005)	0 0 5	D M	~~0 1 4 2 6~~ 01622	P
X	b. RQ, Hazardous Waste Liquid, N.O.S., (1,1,1-Trichloroethane), ORM-E, NA 9189, (F001)(D011)	0 0 1	D M	0 0 3 7 4	P
X	c. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F003)	0 0 6	D M	0 3 0 8 3	P
	d.				

Additional Descriptions for Materials Listed Above:
11a. 55-gl steel drums - ERG Guide #27 attached
11b. 55-gl steel drum - ERG Guide #31 attached
11c. 55-gl steel drums - ERG Guide #26 attached

15. Special Handling Instructions and Additional Information: Site: Page, AZ
11a: RES NO [illegible] (Drum Nos. NGS 91-185 thru 91-188 & NGS 91-036)
11b: RES NO #42583-37 (Drum No. NGS 91-173)
11c: RES NO #43131-37 (Drum Nos. NGS 91-172, 91-175 thru 91-177, 91-183 & 91-189)
TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Gordon M. DAVIS — Signature: Gordon M. Davis — Month Day Year: 09 18 91

17. Transporter 1 Acknowledgement of Receipt of Materials — Date
Printed/Typed Name: Russell Trew — Signature: Russell Trew — Month Day Year: 09 18 91

18. Transporter 2 Acknowledgement of Receipt of Materials — Date
Printed/Typed Name: — Signature: — Month Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. — Date
Printed/Typed Name: — Signature: — Month Day Year:

GENERATOR / TRANSPORTER / FACILITY

White - original Pink TSD Facility Yellow Transporter Green Generator

6 August 1991

Ms. Latha Rajagopalan
Work Assignment Manager
U.S. EPA Region 9
75 Hawthorne Street, S.F. CA H-2
San Francisco, CA 94105

Contract No 068-W9-0009
Work Assignment No. 112-R09030

Subject: Trip Report
Navajo Generating Station, Page, Arizona

Dear Ms. Rajagopalan:

This letter report documents the field activities that took place on July 22-23, 1991 at the Navajo Generating Station (NGS) east of Page, Arizona. The field work included soil sampling performed by Salt River Project (SRP) and its contractor, Brown and Caldwell (BC). The following people were present during the sampling event:

Ron Brazeal (BC)	Jeffrey Forbes (PRC)
Bob Candelaria (SRP)	Doug Laughlin (SRP)
Gordon Davis (SRP)	Latha Rajagopalan (EPA)
Jeff Edmister (SRP)	Dennis Shirley (SRP)

Events are summarized chronologically in this report, along with observed variances from SRP's approved Sampling and Analysis Plan (SAP).

DAY 1
Monday July 22, 1991

Ms. Rajagopalan and Mr. Forbes obtained passes at the NGS gate and met with Mr. Candelaria (SRP) in his office. He explained that sampling activities had been proceeding smoothly during the first several days and that sampling of the West Plant Drainage Area (Area A in SAP) had been completed. The group then observed soil samples being collected with hollow-stem auger and split-spoon sampler at the Soil Accumulation Area (Area C in SAP). Dennis Shirley (SRP) then gave a health and safety briefing. The soil borings in Area C were completed by mid-morning, and the auger rig was moved to the East Coal Pile Terrace (Area D in SAP).

Mr. Candelaria then gave Ms. Rajagopalan and Mr. Forbes a tour of the facility. Following the tour, Mr. Shirley and Mr. Brazeal presented a summary of sampling progress to that point, including the following:

- Nineteen soil borings completed to depths of up to 20 feet in Area A (West Plant Drainage); soil samples from one of the borings showed what appeared to be staining or discoloration.
- Eight soil borings completed to depths of up to 9 feet in Area C (Soil Accumulation Area)
- Eight soil borings completed to depths of up to 10 feet in Area D (East Coal Pile Terrace)
- Five monitoring wells completed to depths of approximately 25 feet in Area A (West Plant Drainage) and Area B (S-13 Impoundment)

Mr. Shirley also discussed several deviations and proposed deviations to the sampling program, including the following:

- The sampling grid for Area C had been modified from that given in the SAP, because the reference coordinates had been incorrect. A revised soil sample location map showing the correct soil boring locations in Area C was provided to replace Figure 21 in the SAP.
- SRP proposed to forego installation of monitoring wells MW-F and MW-G west of the S-14 Impoundment. The reason for eliminating the two wells was that Mr. Shirley believed that it was highly unlikely that perched ground water would be encountered at those locations because of their proximity to the mesa escarpment. The EPA Work Assignment Manager and PRC Project Manager concurred with this assessment, and it was agreed that rather than install the two wells, SRP would check for water in all of the existing wells in Area A (W. Plant Drainage) and Area B (S-13/S-14 Impoundments) during the ground-water sampling event, and that all wells containing water would be sampled.

Mr. Shirley then showed Ms. Rajagopalan and Mr. Forbes the locations of the monitoring wells and soil borings already completed in Areas A and B.

Mr. Forbes requested information on average total chromium concentrations in the flyash, but chromium analyses had apparently not been previously performed, and this information was not available. Mr. Forbes reminded Mr. Shirley that compositing large numbers of samples from the Ash Disposal Area would be risky, because action levels for total chromium could be exceeded, since the action level is reduced by a factor inversely proportional to the number of samples composited (see SRP Sampling and Analysis Plan). Mr. Forbes also pointed out to Mr. Shirley

that the holding time for hexavalent chromium analysis of soil is not 6 months as stated in the SAP. Rather, SW-846 methods specify analysis as soon as possible.

DAY 2
Tuesday July 23, 1991

Six soil borings in the S-14 Impoundment were completed on Tuesday morning. Samples were collected to depths of up to 2.5 feet below ground surface, at which point bedrock was encountered, and refusal of the split-spoon sampler occurred. Because the liner was cored by the split-spoon sampler, it was possible to observe the thickness of sediment that had accumulated in the impoundment during its operational life. The sediment thickness was 1 to 2 inches in most of the borings.

Water levels were then checked in the new monitoring wells and a few of the previously existing wells. The following data were recorded:

Well	Time	Date	Approximate Water Level	Approximate Total Depth
MW-A	1050	7/23	-22.6 ft	-30 ft
MW-B	1045	7/23	dry well	-25 ft
MW-C	1030	7/23	dry well	-17.5 ft
MW-30	1055	7/23	dry well	-19 ft
MW-33	1100	7/23	-9.5 ft	-10 ft
MW-69	1105	7/23	dry well	-13 ft

Water levels and total depths are referenced to ground surface elevation, not top of casing.

By late Tuesday morning, all of the soil borings in Area B (S-14 Impoundment) had been completed, and the auger rig was moved to Area E (Ash Disposal Area). Soil sampling began after lunch with Soil Boring E-2 at Site 1 of Area E. This boring was advanced to a depth of 19 feet, and several layers of reddish-brown soil were encountered within the flyash. Samples were collected from the soil layers, since the soil and liner excavated from the S-13 Impoundment are believed to have been disposed of in Area E.

Before Ms. Rajagopalan left, an informal out-briefing was held between SRP, EPA, and PRC personnel. EPA and PRC stated that the sampling activities were proceeding well and that no procedural changes appeared to be necessary. EPA and PRC requested that a list of variances or deviations to the sampling plan be provided by SRP upon completion of the sampling event. Mr. Shirley agreed to send the list as soon as possible. Mr. Shirley and Mr. Candelaria then took Ms. Rajagopalan and Mr. Forbes to the East Coal Pile Terrace to show them the locations of the soil borings that had been drilled there.

After Ms. Rajagopalan left, Mr. Forbes returned to the facility to observe the continuation of borings in Area E (Ash Disposal Area). The following soil borings were completed in Area E on Tuesday afternoon:

Boring	Approx. Depth
E-2	19 ft
E-3	21.5 ft
E-7	18.5 ft

After the borings were completed late Tuesday afternoon, the drillers decontaminated the auger flights at the decontamination pad by using a steam cleaner. Additional borings were to be drilled in the Ash Disposal Area the following day. Upon completion of oversight activities, Mr. Forbes left the facility.

In summary, the soil sampling program conducted by SRP and BC was professional and thorough. Procedures closely followed the SAP, except for the variances noted above. Observation of sample collection and decontamination techniques indicate no reason to question sample integrity.

PRC will review the Final Investigation Report when it becomes available in mid-October. A complete list of variances to the Sampling and Analysis Plan will be included in PRC's review report. In the meantime, if you have any questions or require further assistance, please call me at (505) 889-9777.

Sincerely,

Jeffrey Forbes

Jeffrey Forbes
PRC Project Manager

cc: Cameron Clark - PRC
David Liu - PRC

ATTACHMENT A
PHOTOGRAPHIC LOG

PHOTOGRAPH NO. 1

Date: 07-23-91 **Picture Taken By:** Jeffrey Forbes **Direction Facing:** South

Photo Description: Brown and Caldwell geologist Ron Brazeal decontaminating split-spoon sampler at decontamination station (in van) at S-14 Impoundment. The decontamination procedure consisted of (1) detergent wash, (2) tap water rinse, (3) nitric acid rinse, (4) tap water rinse, and (5) deionized water rinse (right to left in photo).

PHOTOGRAPH NO. 3

Date: 07-23-91 **Picture Taken By:** Jeffrey Forbes
Direction Facing: South **Photo Description:** Preparing to collect second split spoon sample from Soil Boring B-3 in S-14 Impoundment (2.0-2.5 feet depth). Refusal of sampler occurred at 2.5 feet deep upon encountering Carmel Fm.

PHOTOGRAPH NO. 4

Date: 07-23-91 **Picture Taken By:** Jeffrey Forbes
Direction Facing: North **Photo Description:** Sounding newly-installed monitoring well MW-C on southeast side of S-13 Impoundment. Well was installed two days previously and was dry at time of photograph. Total depth = 17.5 feet.

PHOTOGRAPH NO. 5

Date: 07-23-91 **Picture Taken By:** Jeffrey Forbes
Direction Facing: North **Photo Description:** Split spoon sample being collected from Soil Boring E-2 in Ash Disposal Area. Samples were collected in this boring to depths of 19 feet. White material at surface is a thin layer of water softener sludge overlying flyash and bottom ash.

PHOTOGRAPH NO. 6

Date: 07-24-91 **Picture Taken By:** Jeffrey Forbes **Direction Facing:** Northeast
Photo Description: General view of Navajo Generating Station. The coal-fired power plant produces 2,235 megawatts of electricity from its three turbine-driven generators (at left). Also visible are cooling towers at right. Power lines leaving facility at lower left carry 500,000 volts.

ATTACHMENT B
FIELD LOG

22 July '91 Navajo Generating Stn.
Jeffrey Forbes Page, Arizona

0930 Arrived at NGS w/ Lahta Rajagopalan (EPA-WAM) & met w/ Bob Candelaria (SRP/NGS)

1030 Went to Soil Accum. Area where soil borings in progress. Dennis Shirley (SRP) gave Health & Safety briefing.

Also present:
Ron Brazeal (Brown & Caldwell)
Gordon Davis (SRP/NGS)
Doug Laughlin (SRP)

1040 Auger rig finished drilling in Soil Accum. Area & being moved to E. Coal Pile Terrace.

1100 Returned to office to meet Bob Candelaria.

1315 Began facility tour w/ Bob Candelaria.

7-22-91 NGS continued....

1530 Had briefing by Dennis Shirley & Ron Brazeal on soil borings completed thus far. Also discussed were variances to SAP.

1600 Drove around to see locations of soil borings in Area A (W. Plant Drainage) & monitoring wells MW's A, B, C, D, & E.

1630 Left facility.

7-23-91 Navajo Gen. Stn. Jeffrey Forbes

0845 Arrived at NGS. Left for S-14 Impoundment w/ Gordon Davis (SRP) & Jeff Edmister (SRP)

0900 Arrived at S-14 Impound. Drillers just completing 1st boring in pond (B-7). Top of bedrock (Carmel Fm.) was encountered at ~1.5 ft. depth (split spoon refusal).

0915 Photo #1 (looking S.) showing Decon. Stn. for sampling equip. in back of van. Ron B. (Brown/Caldwell) holding Split spoon sampler.

Decon. sequence =

1. detergent wash
2. tap water rinse
3. nitric acid spray rinse
4. tap water rinse
5. D.I. water spray rinse

0930 Collecting soil boring at B-6 in S-14 Impoundment.

7-23-91 NGS continued...

0945 Split spoon sample refusal at ~2.5 ft. Only 1" of sediment was present above the plastic liner. In order to collect the surface sample, SRP collected a grab sample from the 0-1" sediment above liner Photo #2 (looking down) showing B-6 split spoon sample (Note plastic liner 1" from top & top of Carmel sandstone at bottom)

1005 Photo #3 (looking S) preparing to collect 2nd split spoon from B-3 in S-14 Impoundment (2.0-2.5' depth) Refusal at 2.5 ft. (150 blows / 4 inches)

1030 Checking for water in new MWC on SE side of S-13 Impoundment. (Photo #4 looking S) Hole is dry 2 days after drilling. T.D. = 17.5 ft. b.g.s. Screen = 17.5'-7.5'

7-23-91 NGS....

1045 Checking for water in MWB. Hole is dry. TD=25' Screen=5'-25'

1050 At MWA. Static water level = -24.6' (below top casing) TD = -32' (below casing)

1055 At existing MW30 (dry hole) T.D. ≈ 19 ft. b.g.s.

1100 At existing MW33. Approx. 6" of standing water in well T.D. = 10' b.g.s.

1105 At MW69 (existing) dry hole TD ≅ 13 ft.

1115 Drillers have completed all soil borings at S-14. Moving rig to Ash Disp. Area.

1130 Lunch

1300 Met Bob Candelaria at office

1330 Went to Ash Disp. Area Site 1 to observe 1st boring (E-2) Photo #5 (looking N) showing split spoon sampler driven in Ash Area.

7-23-91 NGS continued....

1400 Requested a list of varriances to SAP from Dennis Shirley upon completion of field activities.

1430 Went to airport w/ Latha.

1630 Returned to Ash Disp. Area. The following soil borings are now completed:

E2	T.D. = 19 ft.
E3	21.5 ft.
E7	18.5 ft.

Drillers decontaminating augers for tomorrow.

1730 End of work for day. Left site.

SALT RIVER PROJECT
POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

August 1, 1991
WQ & WM-9460

Latha Rajagopalan
Compliance Officer
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Re: Changes in Scope of Sampling and Analysis Plan
Navajo Generating Station, Page, AZ
RCRA Docket No. 09-90-0001

Dear Ms. Rajagopalan:

Attached please find a brief summary of field sampling activities conducted from July 17-29, 1991 to determine potential chromium contamination at the Navajo Generating Station. The summary identifies all activities that departed from the scope of the planned sampling program as documented in the final Sampling and Analysis Plan. If you have any questions or comments, please contact me at (602) 236-2685.

Respectfully,

Dennis H. Shirley
Environmental Services Department

DHS:

Attachments

Brown and Caldwell
Consultants

345 East Palm Lane
Suite 200
Phoenix
Arizona 85004-1532
(602) 253-2524
FAX (602) 271-9823

August 1, 1991

Mr. Dennis Shirley
Salt River Project
Post Office Box 52025
Phoenix, Arizona 85072

15-5736/04

Dear Mr. Shirley:

As requested, presented herein is a summary of the field sampling activities conducted at the Navajo Generating Station by Salt River Project (SRP) and Brown and Caldwell (BC) from July 17 through July 29, 1991. This summary documents the work performed and the necessary deviations from the Environmental Protection Agency (EPA)-approved Sampling and Analysis Plan (SAP). Along with this summary are illustrations of the revised physical locations (Figures 1 through 4).

AREA A

According to the original SAP, 19 soil samples were proposed to be collected along with two duplicate samples. No changes were necessary.

AREA B

According to the original SAP, 20 soil samples and two duplicates were proposed to be collected. Instead, 14 samples were collected along with two duplicate samples. Locations B-3 through B-8 were supposed to have three samples collected at three different depths. One sample above the impoundment liner (0 to 1 feet) and two samples below the liner (2.5 to 3.5 feet and 5.0 to 10.0 feet). The first sample was taken at surface level above the liner. The second sample depth was changed from 2.5 to 3.5 feet to 0.5 to 2.0 feet. The third sample was eliminated due to auger and sampler refusal in the Carmel Formation.

AREA C

According to the original SAP, 8 soil samples and one duplicate were proposed to be collected. No changes in the number of soil samples or duplicates were made. However, it was necessary to modify sample locations to provide representative sampling of the stockpile area (see Figure 1). Figure 15 in the SAP did not accurately match the actual stockpile area. The method of choosing random sample locations and depths was still followed according to the SAP.

AREA D

Eight samples and one duplicate sample were collected as proposed in the SAP.

AREA E

Area E is divided into Site 1 and Site 2 (see Figures 2 and 3). Seventy samples were planned to be collected from 35 boreholes at two different depths (0.0 to 5.0 feet and 10.0 to 15.0 feet). It was necessary to revise some borehole locations because the proposed locations were inaccessible to the drill rig or because the proposed site was not actually within the ash disposal area. The proposed number of boreholes were drilled and most boreholes were drilled to a depth of 20 feet. A total of 30 samples were planned to be collected from within Site 1 and 40 samples were planned from within Site 2. However, only 14 samples were collected from Site 1 and 23 samples were collected from Site 2.

Once we began sampling in Area E, it was apparent that it was best to collect samples based on field observations rather than proposed depths. The objective of the investigation was to locate and sample soil which may have been exposed to the bearing cooling water. This soil is typically red or brown in color. Most of the material in the ash disposal area is white or grey ash and slurry. Only a small amount of material encountered was red or brown soil. When red or brown soil was observed during drilling, a sample was collected at that specific depth. This soil was usually found at a single depth within each of the sample locations. This procedure led to deviation from the proposed sampling method of two different depths. The depth at which the soil was observed varied from location to location. Sample depths ranged from the surface to a depth of 19 feet.

MONITORING WELLS

A few deviations from the proposed monitoring well procedures were necessary. Wells A, B, C, D and E were installed according to plan (see Figure 4). Due to the low water yield from these new wells, and the thickness of the Carmel Formation, Wells F and G were eliminated with agreement from Ms. Lahta Rajagopalan and Mr. Jeff Forbes of EPA. If these wells had been installed, it is doubtful that they would have had water. Due to the minimal water yield in Wells A, B, C, D and E, sampling protocol deviated from the original plan. First, these wells were bailed until they were dry. After 48 hours were given for the wells to regenerate, a sample was collected. Wells A and E were the only two wells that had enough water to sample after the 48-hour period. Well 43 had been proposed to be sampled as a background well but was dry. Instead, Well 66 was sampled as a background well due to its distance away from the west sampling area. Pre-existing Wells 31, 71 and 63 were sampled as proposed originally. However, it was necessary to purge the wells to dryness and let them regenerate for 48 hours before sampling.

LABORATORY ANALYSES

Monitoring well samples were analyzed by Westech Laboratory, which is located in Phoenix, instead of Enseco Laboratory, which analyzed the soil boring samples. Due to the pick up and delivery time of Federal Express in the Page area, water samples could not be extracted within the 24-hour holding time for hexavalent chromium at the California location of Enseco. Water samples were collected in the late

afternoon on the last day of field activities. The samples were then driven to Phoenix that night and delivered to Westech Laboratory the following morning for analysis.

If you have any questions or need more information, please contact me at (602) 253-2524.

Very truly yours,

BROWN AND CALDWELL

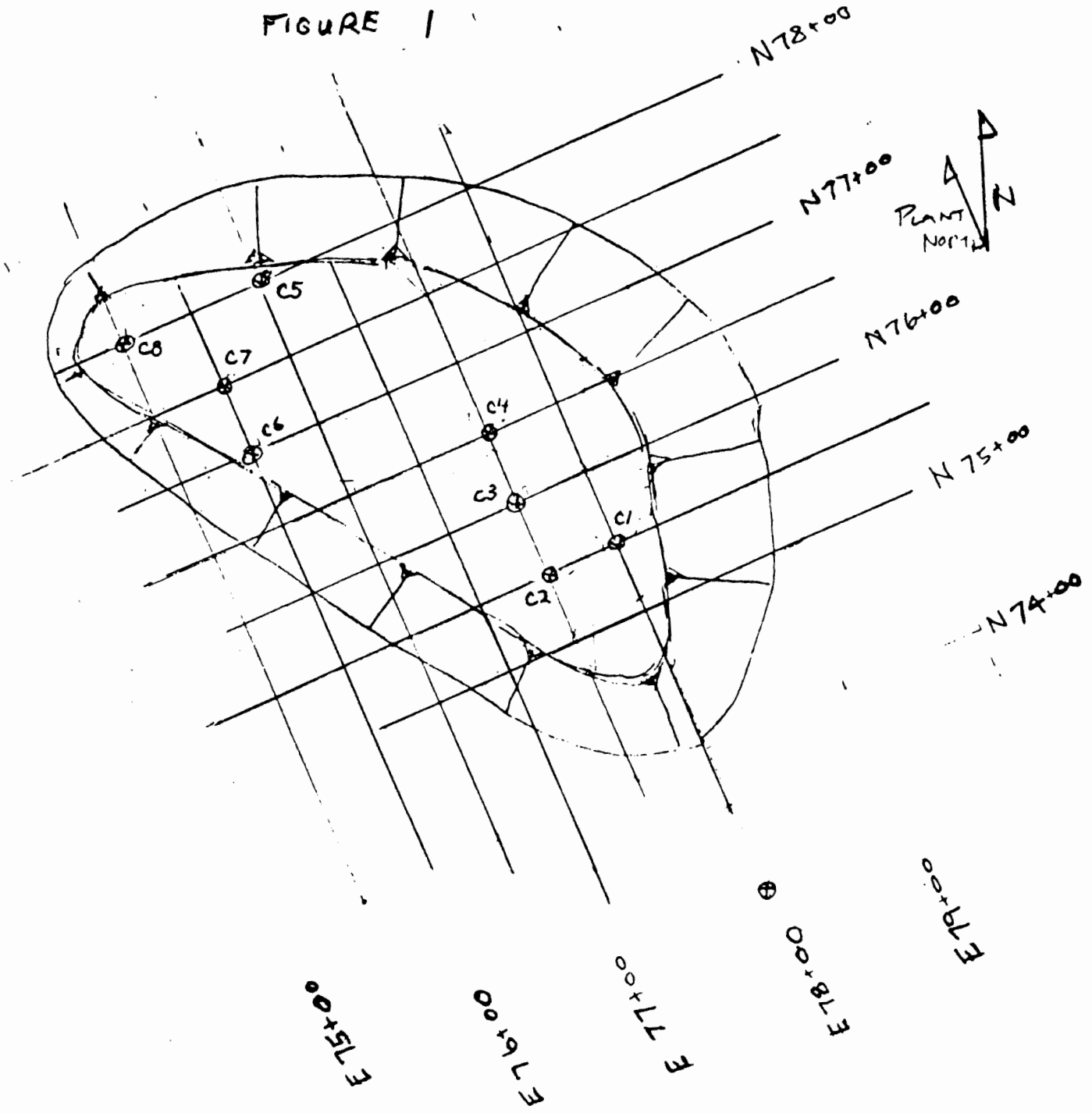
Ronald K. Brazeal

for Katherine S. Roxlo
Senior Hydrogeologist

RKB:kw

AREA C SOIL ACCUMULATION AREA

FIGURE 1



ID	LOCATION		DEPTH
C8	N78+00	E75+50	2
C7	77+50	76+00	3
C6	77+00	76+00	5
C5	78+00	77+00	4
C4	76+50	77+50	1
C3	76+00	77+50	1
C2	75+50	77+50	5

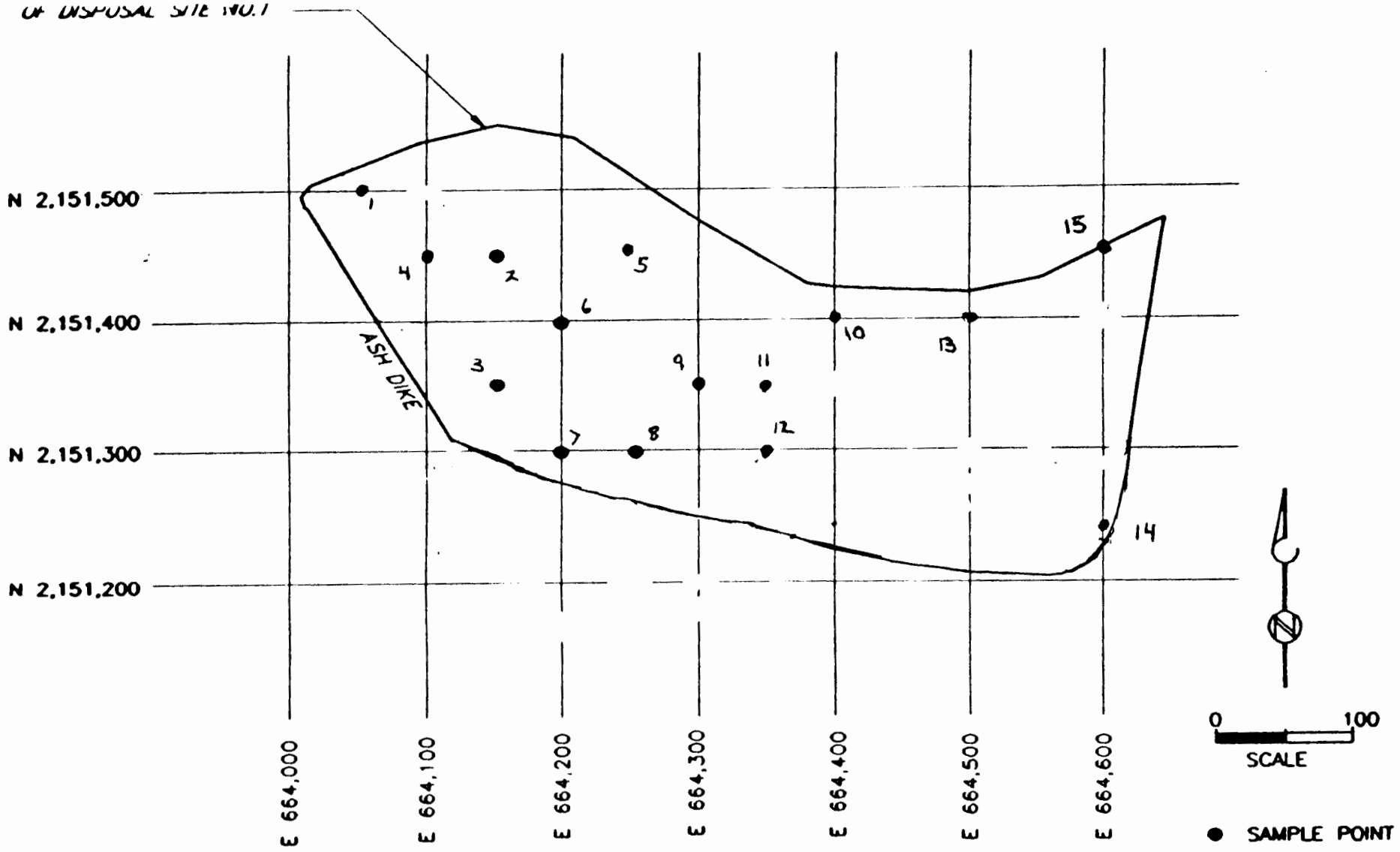


FIGURE 2. . DESIGNATION OF SAMPLE POINTS
SOIL SAMPLING AREA: SITE 1
ASH DISPOSAL AREA

5736-03-F23

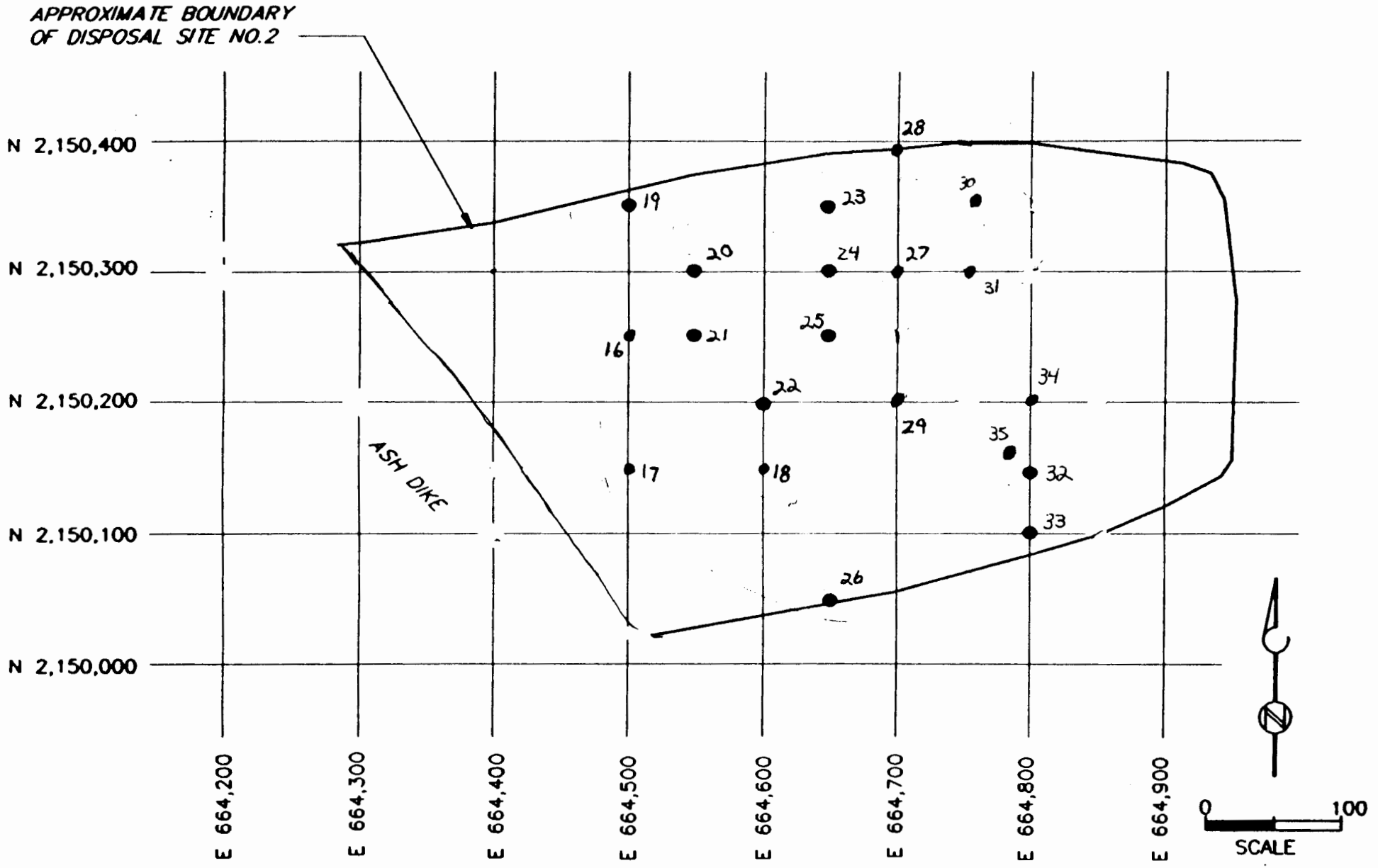


FIGURE 3. DESIGNATION OF SAMPLE POINTS
SOIL SAMPLING AREA: SITE 2
ASH DISPOSAL AREA

5736-03-F23

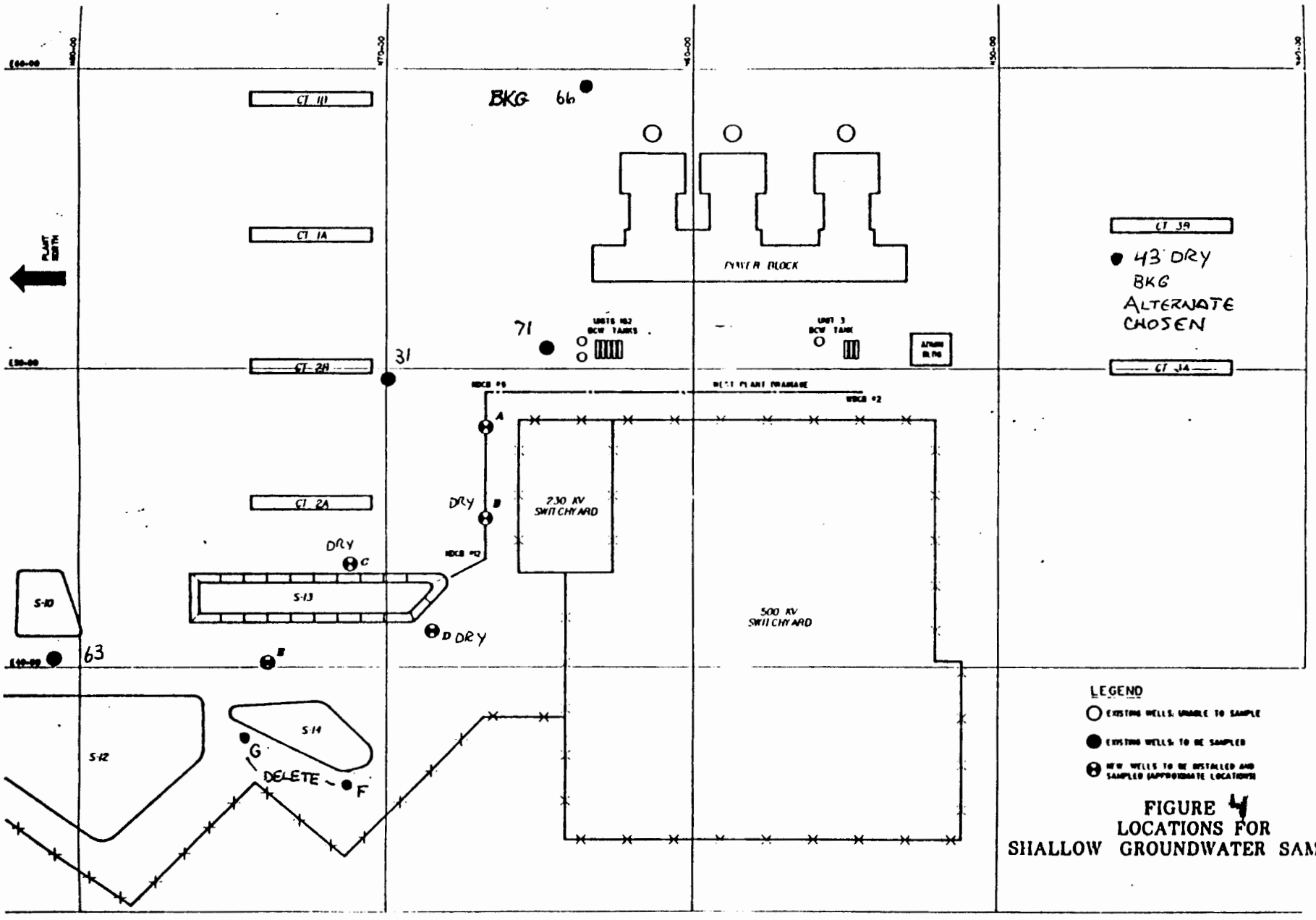


FIGURE 4
LOCATIONS FOR
SHALLOW GROUNDWATER SAMI

SALT RIVER PROJECT

POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

W&W-9445

Overnight Mail

July 3, 1991

Ms. Lahta Rajagoplan
Compliance Officer
U.S. Environmental Protection Agency
Region IX (H-2-2)
75 Hawthorne Street
San Francisco, CA 94105

RE: Navajo Generating Station RCRA Docket #09-90-0001 -
Consent Agreement and Final Order (CA/FO)

Dear Ms. Rajagoplan:

Pursuant to the requirement of the CA/FO, enclosed is the quarterly report for the Salt River Projects's (SRP) Navajo Generating Station. The quarterly report consists of the monthly hazardous waste activities for the months of April, May, and June of 1991.

The report identifies the amount and types of hazardous waste generated, the dates accumulation began, the name of the TSD to which the waste was shipped, the dates the waste was shipped, and copies of accompanying manifests (manifest document numbers 91N06, 91N07, and 91N09; manifest 91N08 was a PCB shipment and is not included in this report).

If there are any questions regarding this report, please contact me at (602) 236-2811.

Sincerely,

Daniel J. Casiraro

Daniel J. Casiraro
Principal Staff Engineer
Environmental Management Services

DJC:dg
Enclosures

cc: Jeffrey Zelikson, U.S. EPA
Louise Lincoln, Navajo EPA

File: LOC-5-4/HZW-1-4

APRIL HAZARDOUS WASTE ACTIVITIES

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Apr, 1991

FACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ON SITE ACCUMULATION: ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	DISPOSAL INFORMATION: RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
NAVAJO CENTRAL STORAGE																	
TOTAL NAVAJO CENTRAL STORAGE						0	0	0				0					
PREPARED BY:					APPROVED BY:												
NAVAJO GEN. STATION																	
NGS-90051	WASTE SOLVENT		N	N	03/25/91	322	0	0	03/25/91	06/23/91	04/30/91	322	DM 55	91N07	06/04/91		36
NGS-90085	WASTE SOLVENT		N	N	02/11/91	510	0	0	02/11/91	05/12/91	04/16/91	510	DM 55	91N06	05/21/91		64
NGS-90087	WASTE SOLVENT		N	N	04/01/91	220	0	120	04/01/91	06/30/91	04/30/91	340	DM 55	91N07	06/04/91		29
NGS-90088	WASTE SOLVENT		N	N	03/04/91	383	0	0	03/04/91	06/02/91	04/16/91	383	DM 55	91N06	05/21/91		43
NGS-90092	WASTE PAINT		N	N	02/04/91	476	0	0	02/04/91	05/05/91	04/16/91	476	DM 55	91N06	05/21/91		71
NGS-91001	WASTE SOLVENT		N	N	01/01/91	110	110	0				0	DM 55				
NGS-91014	WASTE SOLVENT		N	N	03/25/91	394	0	0	03/25/91	06/23/91	04/30/91	394	DM 55	91N07	06/04/91		36
NGS-91015	WASTE SOLVENT		N	N	04/03/91	0	460	460	04/30/91	07/29/91		0	DM 55				
NGS-91016	WASTE PAINT		N	N	02/20/91	475	0	0	02/20/91	05/21/91	04/16/91	475	DM 55	91N06	05/21/91		55
NGS-91017	WASTE SOLVENT		N	N		330	330	0				0	DM 55				
NGS-91032	WASTE SOLVENT	91-26A	N	N	02/04/91	415	0	0	02/04/91	05/05/91	04/16/91	415	DM 55	91N06	05/21/91		71
NGS-91033	WASTE SOLVENT	91-26B	N	N	02/04/91	450	0	0	02/04/91	05/05/91	04/16/91	450	DM 55	91N06	05/21/91		71
NGS-91034	WASTE SOLVENT	91-26C	N	N	02/04/91	320	0	0	02/04/91	05/05/91	04/16/91	320	DM 55	91N06	05/21/91		71
NGS-91035	WASTE PAINT		N	N	03/01/91	442	0	0	03/01/91	05/30/91	04/16/91	442	DM 55	91N06	05/21/91		46
NGS-91037	WASTE PAINT		N	N	03/18/91	438	0	0	03/18/91	06/16/91	04/30/91	438	DM 55	91N07	06/04/91		43
NGS-91038	WASTE SOLVENT	91-067	N	N	02/22/91	350	0	0	02/22/91	05/23/91	04/16/91	350	DM 55	91N06	05/21/91		53
NGS-91040	WASTE SOLVENT	91-67A	N	N	03/11/91	305	305	0	03/11/91	06/09/91		0	DM 55				
NGS-91041	WASTE PAINT		N	N	03/25/91	450	0	0	03/25/91	06/23/91	04/30/91	450	DM 55	91N07	06/04/91		
NGS-91042	WASTE SOLVENT		N	N	03/25/91	0	220	220				0	DM 55				
NGS-91043	WASTE PAINT		N	N	04/01/91	220	0	310	04/01/91	06/30/91	04/30/91	530	DM 55	91N07	06/04/91		29
NGS-91044	WASTE SOLVENT		N	N		0	220	220				0	DM 55				
NGS-91045	WASTE SOLVENT	91083A	Y	N	03/18/91	365	365	0	03/18/91	06/16/91		0	DM 55				
NGS-91046	WASTE PAINT	91-046	N	N	03/28/91	446	0	0	03/28/91	06/26/91	04/30/91	446	DM 55	91N07	06/04/91		33
NGS-91047	WASTE PAINT	91-46A	N	N	03/28/91	458	0	0	03/28/91	06/26/91	04/30/91	458	DM 55	91N07	06/04/91		33
NGS-91048	WASTE SOLVENT	91083B	Y	N	03/25/91	412	412	0	03/25/91	06/23/91		0	DM 55				
NGS-91049	WASTE SOLVENT	91083C	Y	N	03/29/91	380	380	0	03/29/91	06/27/91		0	DM 55				
NGS-91050	WASTE PAINT		N	N	04/01/91	0	0	558	04/17/91	07/16/91	04/30/91	558	DM 55	91N07	06/04/91		29
NGS-91051	WASTE PAINT		N	N	04/16/91	0	0	435	04/16/91	07/15/91	04/30/91	435	DM 55	91N07	06/04/91		14
NGS-91053	WASTE SOLVENT		N	N	04/01/91	0	495	495	04/29/91	07/28/91		0	DM 55				

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Apr, 1991

FACILITY: NAVAJO GEN STATION EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* PA	* AH	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
					---------ON SITE ACCUMULATION----------						----------DISPOSAL INFORMATION----------						
NGS-91054	WASTE SOLVENT		N	N	04/22/91	0	110	110				0	DM 55				
NGS-91056	WASTE PAINT		N	N	04/29/91	0	423	423				0	DM 55				
NGS-91060	GREASE		N	N	04/01/91	0	454	454				0	DM 55				
NGS-91062	WASTE SOLVENT		N	N	10/27/90	0	287	287	04/17/91	07/16/91		0	DM 55				
NGS-91064	WASTE SOLVENT		N	N	02/04/91	0	455	455	04/08/91	07/07/91		0	DM 55				
NGS-91067	WASTE SOLVENT		N	N	03/18/91	250						0	DM 55				
NGS-91068	WASTE SOLVENT		N	N	03/29/91	320						0	DM 55				
NGS-91072	WASTE OIL		N	N	04/16/91	0	395	395	04/16/91	07/15/91		0	DM 55				
NGS-91148	WASTE OIL		N	N	04/17/91	0	375	375	04/17/91	07/16/91		0	DM 55				
	TOTAL NAVAJO GEN. STATION					9241	5796	5317				8192					

PREPARED BY: GORDON DAVIS APPROVED BY: BOB CANDELARIA

	TOTAL NAVAJO GEN STATION					9241	5796	5317				8192					

GENERATOR STATUS=LARGE QUANTITY GENERATOR

ALL WEIGHTS ARE IN POUNDS

MAY HAZARDOUS WASTE ACTIVITIES

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF May, 1991

FACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
NAVAJO CENTRAL STORAGE																	
	TOTAL NAVAJO CENTRAL STORAGE					0	0	0				0					
	PREPARED BY:				APPROVED BY:												
NAVAJO GEN. STATION																	
NGS-90089	MERCURY		N	N		0	20	20				0	DM 16				
NGS-91001	WASTE SOLVENT		N	N	01/01/91	110	110	0				0	DM 55				
NGS-91015	WASTE SOLVENT		N	N	04/03/91	460	0	0	04/30/91	07/29/91	05/16/91	460	DM 55	91N09	06/20/91		43
NGS-91017	WASTE SOLVENT		N	N		330	0	0	05/16/91		05/16/91	330	DM 55	91N09	06/20/91		
NGS-91036	WASTE SOLVENT		N	N	03/04/91	0	110	110				0	DM 55				
NGS-91040	WASTE SOLVENT	91-67A	N	N	03/11/91	305	0	0	03/11/91	06/09/91	05/16/91	305	DM 55	91N09	06/20/91		66
NGS-91042	WASTE SOLVENT		N	N	03/25/91	220	220	0				0	DM 55				
NGS-91044	WASTE SOLVENT		N	N		220	0	0	05/16/91		05/16/91	220	DM 55	91N09	06/20/91		
NGS-91045	WASTE SOLVENT	91083A	N	N	03/18/91	365	0	0	03/18/91	06/16/91	05/16/91	365	DM 55	91N09	06/20/91		59
NGS-91048	WASTE SOLVENT	91083B	N	N	03/25/91	412	0	0	03/25/91	06/23/91	05/16/91	412	DM 55	91N09	06/20/91		52
NGS-91049	WASTE SOLVENT	91083C	N	N	03/29/91	380	0	0	03/29/91	06/27/91	05/16/91	380	DM 55	91N09	06/20/91		48
NGS-91052	WASTE SOLVENT		N	N	04/17/91	0	110	110				0	DM 55				
NGS-91053	WASTE SOLVENT		N	N	04/01/91	495	0	0	04/29/91	07/28/91	05/16/91	495	DM 55	91N09	06/20/91		45
NGS-91054	WASTE SOLVENT		N	N	04/22/91	110	110	0				0	DM 55				
NGS-91055	WASTE SOLVENT		N	N	05/02/91	0	110	110				0	DM 55				
NGS-91056	WASTE PAINT		N	N	04/29/91	423	423	0	05/23/91	08/21/91		0	DM 55				
NGS-91057	OVERPACK DRUM		N	N	05/06/91	0	305	305	05/06/91	08/04/91		0	DM 85				
NGS-91058	GREASE		N	N	05/06/91	0	61	61				0	DM 55				
NGS-91060	GREASE		N	N	04/01/91	454	454	0	05/01/91	07/30/91		0	DM 55				
NGS-91062	WASTE SOLVENT		N	N	10/27/90	287	287	0	04/17/91	07/16/91		0	DM 55				
NGS-91063	WASTE SOLVENT		N	N	05/23/91	0	220	220				0	DM 55				
NGS-91064	WASTE SOLVENT		N	N	02/04/91	455	455	0	04/08/91	07/07/91		0	DM 55				
NGS-91067	WASTE SOLVENT		N	N	03/18/91	250	250	0	05/03/91	08/01/91		0	DM 55				
NGS-91068	WASTE SOLVENT		N	N	03/29/91	320	320	0	05/13/91	08/11/91		0	DM 55				
NGS-91072	WASTE OIL		N	N	04/16/91	395	395	0	04/16/91	07/15/91		0	DM 55				
NGS-91078	GREASE		N	N	05/02/91	0	203	203	05/02/91	07/31/91		0	DM 55				
NGS-91079	GREASE		N	N	05/02/91	0	303	303	05/02/91	07/31/91		0	DM 55				
NGS-91080	GREASE		N	N	05/02/91	0	141	141	05/02/91	07/31/91		0	DM 55				
NGS-91081	GREASE		N	N	05/02/91	0	159	159	05/02/91	07/31/91		0	DM 55				

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF May, 1991

FACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452426

		ON SITE ACCUMULATION							DISPOSAL INFORMATION							
CONTAINER ID#	CONTENTS	ANLYS NUMBER	* PA	* AH	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY	VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
NGS-91082	GREASE		N	N	05/02/91	0	381	381	05/02/91	07/31/91		0	DM	55				
NGS-91083	GREASE		N	N	05/02/91	0	135	135	05/02/91	07/31/91		0	DM	55				
NGS-91084	GREASE		N	N	05/02/91	0	327	327	05/02/91	07/31/91		0	DM	55				
NGS-91085	GREASE		N	N	05/02/91	0	95	95	05/02/91	07/31/91		0	DM	55				
NGS-91086	GREASE		N	N	05/02/91	0	334	334	05/02/91	07/31/91		0	DM	55				
NGS-91087	GREASE		N	N	05/02/91	0	100	100	05/02/91	07/31/91		0	DM	55				
NGS-91088	GREASE		N	N	05/02/91	0	275	275	05/02/91	07/31/91		0	DM	55				
NGS-91089	GREASE		N	N	05/02/91	0	105	105	05/02/91	07/31/91		0	DM	55				
NGS-91090	GREASE		N	N	05/02/91	0	390	390	05/02/91	07/31/91		0	DM	55				
NGS-91091	GREASE		N	N	05/02/91	0	134	134	05/02/91	07/31/91		0	DM	55				
NGS-91092	WASTE OIL		N	N	05/02/91	0	265	265	05/02/91	07/31/91		0	DM	55				
NGS-91093	GREASE		N	N	05/02/91	0	245	245	05/02/91	07/31/91		0	DM	55				
NGS-91094	GREASE		N	N	05/02/91	0	320	320	05/02/91	07/31/91		0	DM	55				
NGS-91095	GREASE		N	N	05/02/91	0	100	100	05/02/91	07/31/91		0	DM	55				
NGS-91097	WASTE OIL		N	N	05/03/91	0	345	345	05/03/91	08/01/91		0	DM	55				
NGS-91098	WASTE OIL		N	N	05/03/91	0	395	395	05/03/91	08/01/91		0	DM	55				
NGS-91099	WASTE OIL		N	N	05/02/91	0	80	80	05/02/91	07/31/91		0	DM	55				
NGS-91100	WASTE OIL		N	N	05/03/91	0	120	120	05/03/91	08/01/91		0	DM	55				
NGS-91101	WASTE OIL		N	N	05/03/91	0	435	435	05/03/91	08/01/91		0	DM	55				
NGS-91102	WASTE OIL		N	N	05/03/91	0	380	380	05/03/91	08/01/91		0	DM	55				
NGS-91103	WASTE OIL		N	N	05/03/91	0	168	168	05/03/91	08/01/91		0	DM	55				
NGS-91104	WASTE OIL		N	N	05/03/91	0	100	100	05/03/91	08/01/91		0	DM	55				
NGS-91105	WASTE OIL		N	N	05/03/91	0	385	385	05/03/91	08/01/91		0	DM	55				
NGS-91106	WASTE OIL		N	N	05/03/91	0	97	97	05/03/91	08/01/91		0	DM	55				
NGS-91107	WASTE OIL		N	N	05/03/91	0	190	190	05/03/91	08/01/91		0	DM	55				
NGS-91111	WASTE OIL		N	N	05/03/91	0	335	335	05/03/91	08/01/91		0	DM	55				
NGS-91115	WASTE OIL		N	N	05/03/91	0	470	470	05/03/91	08/01/91		0	DM	55				
NGS-91118	WASTE OIL		N	N	05/03/91	0	448	448	05/03/91	08/01/91		0	DM	55				
NGS-91121	WASTE OIL		N	N	05/03/91	0	270	270	05/03/91	08/01/91		0	DM	55				
NGS-91122	WASTE OIL		N	N	05/03/91	0	192	192	05/03/91	08/01/91		0	DM	55				
NGS-91123	WASTE OIL		N	N	05/03/91	0	471	471	05/03/91	08/01/91		0	DM	55				
NGS-91133	WASTE OIL		N	N	05/14/91	0	80	80	05/14/91	08/12/91		0	DM	55				
NGS-91134	WASTE OIL		N	N	05/14/91	0	230	230	05/14/91	08/12/91		0	DM	55				
NGS-91135	WASTE OIL		N	N	05/14/91	0	310	310	05/14/91	08/12/91		0	DM	55				
NGS-91138	WASTE OIL		N	N	05/14/91	0	212	212	05/14/91	08/12/91		0	DM	55				
NGS-91139	WASTE SOLVENT		N	N	04/29/91	0	419	419	05/23/91	08/21/91		0	DM	55				
NGS-91141	WASTE SOLVENT		N	N	03/25/91	0	220	220				0	DM	55				
NGS-91142	WASTE SOLVENT		N	N	11/12/90	0	342	342	05/31/91	08/29/91		0	DM	55				
NGS-91146	WASTE PAINT		N	N	05/23/91	0	110	110				0	DM	55				
NGS-91148	WASTE OIL		N	N	04/17/91	375	375	0	04/17/91	07/16/91		0	DM	55				
TOTAL NAVAJO GEN. STATION						6366	15151	11752				2967						

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF May, 1991

FACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ON SITE ACCUMULATION: ANLYS NUMBER	* PA	* AH	START DATE	START WGT	END WGT	ACCUM WGT	DISPOSAL INFORMATION: RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
PREPARED BY:					APPROVED BY:												
TOTAL NAVAJO GEN STATION						6366	15151	11752				2967					

GENERATOR STATUS=LARGE QUANTITY GENERATOR

ALL WEIGHTS ARE IN POUNDS

JUNE HAZARDOUS WASTE ACTIVITIES

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Jun, 1991

FACILITY: NAVAJO GEN STATION EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
NAVAJO CENTRAL STORAGE																	
TOTAL NAVAJO CENTRAL STORAGE						0	0	0				0					
PREPARED BY:					APPROVED BY:												
NAVAJO GEN. STATION																	
NGS-90089	MERCURY		N	N	11/30/90	20	20	0				0	DM	16			
NGS-91001	WASTE SOLVENT		N	N	01/01/91	110	110	0				0	DM	55			
NGS-91036	WASTE SOLVENT		N	N	03/04/91	110	220	110				0	DM	55			
NGS-91042	WASTE SOLVENT		N	N	03/25/91	220	220	0				0	DM	55			
NGS-91052	WASTE SOLVENT		N	N	04/17/91	110	330	220				0	DM	55			
NGS-91054	WASTE SOLVENT		N	N	04/22/91	110	110	0				0	DM	55			
NGS-91055	WASTE SOLVENT		N	N	05/02/91	110	110	0				0	DM	55			
NGS-91056	WASTE PAINT		N	N	04/29/91	423	423	0	05/23/91	08/21/91		0	DM	55			
NGS-91057	OVERPACK DRUM (Tar)		N	N	05/06/91	305	305	0	05/06/91	08/04/91		0	DM	85			
NGS-91058	GREASE		N	N	05/06/91	61	111	50				0	DM	55			
NGS-91059	FILTERS		N	N	05/06/91	0	20	20				0	DM	12			
NGS-91060	GREASE		N	N	04/01/91	454	454	0	05/01/91	07/30/91		0	DM	55			
NGS-91062	WASTE SOLVENT		N	N	10/27/90	287	287	0	04/17/91	07/16/91		0	DM	55			
NGS-91063	WASTE SOLVENT		N	N	05/23/91	220	220	0				0	DM	55			
NGS-91064	WASTE SOLVENT		N	N	02/04/91	455	455	0	04/08/91	07/07/91		0	DM	55			
NGS-91067	WASTE SOLVENT		N	N	03/18/91	250	250	0	05/03/91	08/01/91		0	DM	55			
NGS-91068	WASTE SOLVENT		N	N	03/29/91	320	320	0	05/13/91	08/11/91		0	DM	55			
NGS-91072	WASTE OIL		N	N	04/16/91	395	395	0	04/16/91	07/15/91		0	DM	55			
NGS-91078	GREASE		N	N	05/02/91	203	203	0	05/02/91	07/31/91		0	DM	55			
NGS-91079	GREASE		N	N	05/02/91	303	303	0	05/02/91	07/31/91		0	DM	55			
NGS-91080	GREASE		N	N	05/02/91	141	141	0	05/02/91	07/31/91		0	DM	55			
NGS-91081	GREASE		N	N	05/02/91	159	159	0	05/02/91	07/31/91		0	DM	55			
NGS-91082	GREASE		N	N	05/02/91	381	381	0	05/02/91	07/31/91		0	DM	55			
NGS-91083	GREASE		N	N	05/02/91	135	135	0	05/02/91	07/31/91		0	DM	55			
NGS-91084	GREASE		N	N	05/02/91	327	327	0	05/02/91	07/31/91		0	DM	55			
NGS-91085	GREASE		N	N	05/02/91	95	95	0	05/02/91	07/31/91		0	DM	55			
NGS-91086	GREASE		N	N	05/02/91	334	334	0	05/02/91	07/31/91		0	DM	55			
NGS-91087	GREASE		N	N	05/02/91	100	100	0	05/02/91	07/31/91		0	DM	55			
NGS-91088	GREASE		N	N	05/02/91	275	275	0	05/02/91	07/31/91		0	DM	55			

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Jun, 1991

FACILITY: NAVAJO GEN STATION

EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* PA	* AH	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY	DRUM VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
			ON SITE ACCUMULATION							DISPOSAL INFORMATION								
NGS-91089	GREASE		N	N	05/02/91	105	105	0	05/02/91	07/31/91		0	DM	55				
NGS-91090	GREASE		N	N	05/02/91	390	390	0	05/02/91	07/31/91		0	DM	55				
NGS-91091	GREASE		N	N	05/02/91	134	134	0	05/02/91	07/31/91		0	DM	55				
NGS-91092	WASTE OIL		N	N	05/02/91	265	265	0	05/02/91	07/31/91		0	DM	55				
NGS-91093	GREASE		N	N	05/02/91	245	245	0	05/02/91	07/31/91		0	DM	55				
NGS-91094	GREASE		N	N	05/02/91	320	320	0	05/02/91	07/31/91		0	DM	55				
NGS-91095	GREASE		N	N	05/02/91	100	100	0	05/02/91	07/31/91		0	DM	55				
NGS-91097	WASTE OIL		N	N	05/03/91	345	345	0	05/03/91	08/01/91		0	DM	55				
NGS-91098	WASTE OIL		N	N	05/03/91	395	395	0	05/03/91	08/01/91		0	DM	55				
NGS-91099	WASTE OIL		N	N	05/02/91	80	80	0	05/02/91	07/31/91		0	DM	55				
NGS-91100	WASTE OIL		N	N	05/03/91	120	120	0	05/03/91	08/01/91		0	DM	55				
NGS-91101	WASTE OIL		N	N	05/03/91	435	435	0	05/03/91	08/01/91		0	DM	55				
NGS-91102	WASTE OIL		N	N	05/03/91	380	380	0	05/03/91	08/01/91		0	DM	55				
NGS-91103	WASTE OIL		N	N	05/03/91	168	168	0	05/03/91	08/01/91		0	DM	55				
NGS-91104	WASTE OIL		N	N	05/03/91	100	100	0	05/03/91	08/01/91		0	DM	55				
NGS-91105	WASTE OIL		N	N	05/03/91	385	385	0	05/03/91	08/01/91		0	DM	55				
NGS-91106	WASTE OIL		N	N	05/03/91	97	97	0	05/03/91	08/01/91		0	DM	55				
NGS-91107	WASTE OIL		N	N	05/03/91	190	190	0	05/03/91	08/01/91		0	DM	55				
NGS-91111	WASTE OIL		N	N	05/03/91	335	335	0	05/03/91	08/01/91		0	DM	55				
NGS-91115	WASTE OIL		N	N	05/03/91	470	470	0	05/03/91	08/01/91		0	DM	55				
NGS-91118	WASTE OIL		N	N	05/03/91	448	448	0	05/03/91	08/01/91		0	DM	55				
NGS-91121	WASTE OIL		N	N	05/03/91	270	270	0	05/03/91	08/01/91		0	DM	55				
NGS-91122	WASTE OIL		N	N	05/03/91	192	192	0	05/03/91	08/01/91		0	DM	55				
NGS-91123	WASTE OIL		N	N	05/03/91	471	471	0	05/03/91	08/01/91		0	DM	55				
NGS-91133	WASTE OIL		N	N	05/14/91	80	80	0	05/14/91	08/12/91		0	DM	55				
NGS-91134	WASTE OIL		N	N	05/14/91	230	230	0	05/14/91	08/12/91		0	DM	55				
NGS-91135	WASTE OIL		N	N	05/14/91	310	310	0	05/14/91	08/12/91		0	DM	55				
NGS-91138	WASTE OIL		N	N	05/14/91	212	212	0	05/14/91	08/12/91		0	DM	55				
NGS-91139	WASTE SOLVENT		N	N	04/29/91	419	419	0	05/23/91	08/21/91		0	DM	55				
NGS-91141	WASTE SOLVENT		N	N	03/25/91	220	220	0				0	DM	55				
NGS-91142	WASTE SOLVENT		N	N	11/12/90	342	342	0	05/31/91	08/29/91		0	DM	55				
NGS-91145	WASTE SOLVENT		N	N	05/20/91	0	161	161	06/05/91	09/03/91		0	DM	55				
NGS-91146	WASTE PAINT		N	N	05/23/91	110	330	220				0	DM	55				
NGS-91148	WASTE OIL		N	N	04/17/91	375	375	0	04/17/91	07/16/91		0	DM	55				
NGS-91149	WASTE SOLVENT		N	N	06/07/91	0	110	110				0	DM	55				
NGS-91150	WASTE SOLVENT		N	N	06/07/91	0	330	330				0	DM	55				
NGS-91151	CHROME DEBRIS		N	N	06/08/91	0	104	104	06/11/91	09/09/91		0	DM	55				
NGS-91152	CHROME DEBRIS		N	N	06/08/91	0	88	88	06/11/91	09/09/91		0	DM	55				
NGS-91153	CHROME DEBRIS		N	N	06/08/91	0	101	101	06/11/91	09/09/91		0	DM	55				
NGS-91154	CHROME DEBRIS	Old	N	N	06/08/91	0	92	92	06/11/91	09/09/91		0	DM	55				
NGS-91155	CHROME DEBRIS	Insulation	N	N	06/08/91	0	110	110	06/11/91	09/09/91		0	DM	55				
NGS-91158	CHROME DEBRIS		N	N	06/08/91	0	94	94	06/12/91	09/10/91		0	DM	55				
NGS-91159	GREASE		N	N	06/20/91	0	382	382	06/20/91	09/18/91		0	DM	55				
NGS-91160	WASTE OIL		N	N	06/25/91	0	447	447	06/25/91	09/23/91		0	DM	55				

SALT RIVER PROJECT
MONTHLY FACILITY SUMMARY
REPORT ON HAZARDOUS WASTE
DURING THE MONTH OF Jun, 1991

FACILITY: NAVAJO GEN STATION EPA-ID: AZD074452426

CONTAINER ID#	CONTENTS	ANLYS NUMBER	* P A	* A H	START DATE	START WGT	END WGT	ACCUM WGT	RECD CENTRAL STORAGE	SHIPPING DUE DATE	SHIP DATE	SHIP WGT	DRUM TY	DRUM VO	MANIF NO	MANIF DUE DATE	MAN RET	DAYS ON SITE
NGS-91161	WASTE OIL		N	N	06/25/91	0	183	183	06/25/91	09/23/91		0	DM	55				
NGS-91162	Gasoline Waste		N	N	06/25/91	0	110	110	06/25/91	09/23/91		0	DM	55				
NGS-91163	SOIL-SOLVENT CONTAM		N	N	06/25/91	0	88	88	06/25/91	09/23/91		0	DM	55				
NGS-91164	SOIL-SOLVENT CONTAM		N	N	06/25/91	0	379	379	06/25/91	09/23/91		0	DM	55				
NGS-91165	GREASE		N	N	06/25/91	0	247	247	06/25/91	09/23/91		0	DM	85				
NGS-91166	WASTE OIL		N	N	06/25/91	0	423	423	06/25/91	09/23/91		0	DM	55				
NGS-91167	GREASE		N	N	06/05/91	0	30	30				0	DM	12				
NGS-91168	GREASE		N	N	06/26/91	0	330	330				0	DM	55				
NGS-91169	WASTE OIL		N	N	06/26/91	0	154	154	06/26/91	09/24/91		0	DM	55				
NGS-91170	MACHINE COOLANT		N	N	06/26/91	0	500	500	06/26/91	09/24/91		0	DM	55				
NGS-91171	WASTE OIL		N	N	06/26/91	0	255	255	06/26/91	09/24/91		0	DM	55				
TOTAL NAVAJO GEN. STATION						15151	20489	5338				0						

PREPARED BY: GMDAVIS APPROVED BY: CDBRUMBACK

TOTAL NAVAJO GEN STATION						15151	20489	5338				0						

GENERATOR STATUS=LARGE QUANTITY GENERATOR

ALL WEIGHTS ARE IN POUNDS

APRIL, MAY AND JUNE MANIFESTS

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: A Z D 0 7 4 4 5 2 4 2 6 | Manifest Document No.: 91N06

2. Page 1 of 2 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

A. State Manifest Document Number: Nº 00437005

B. State Generator's ID: 99904

4. Generator's Phone (602) 645-8811

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.

6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID: 40158

D. Transporter's Phone: (602) 624-2348

7. Transporter 2 Company Name: CUSTOM ENVIRONMENTAL TRANSPORT

8. US EPA ID Number: D E D 9 8 0 9 1 8 8 5 8

E. State Transporter's ID: 40754

F. Transporter's Phone: 713) 930-4500

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID: 50089

H. Facility's Phone: (713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (Xylene, Toluene), Flammable Liquid, UN 1993, (F001)(F003)(F005)	001	DM	00350	P	F001, F003, F005, 910100
x	b. RQ, Waste Flammable Liquid, N.O.S., (Xylene, Toluene), Flammable Liquid, UN 1993, (F003)(F005)	001	DM	00510	P	F003, F005 910100
x	c. RQ, Waste Flammable Liquid, N.O.S., (Xylene, Toluene), Flammable Liquid, UN 1993, (D008)(F003)(F005)	001	DM	00383	P	D008, F003, F005, 910100
x	d. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Toluene), Flammable Liquid, UN 1993, (D018)(F001)(F005)	001	DM	00450	P	D018, F001, F005, 910100

J. Additional Descriptions for Materials Listed Above
11a, 11b, 11c, 11d. 55-gl steel drums
ERG Guide No. 27 attached

K. Handling Codes for Wastes Listed Above
T06

15. Special Handling Instructions and Additional Information
11a, 11b, 11c, 11d. RES HO #42593-37 (Drum Nos. NGS 91-038, NGS 90-085, NGS 90-088 & NGS 91-033)
Telephone No. (602) 236-5305 (For Emergency Response) Site: Page, AZ

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Gordon M. DAVIS
Signature: Gordon M. Davis
Month Day Year: 04 16 91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JOSEPH PAUL WILSON
Signature: Joseph Paul Wilson
Date: Month Day Year: 04 16 91

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: CHERIE D. COSBY
Signature: Cherie D. Cosby
Date: Month Day Year: 04 23 91

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Karen Peters
Signature: Karen Peters
Date: Month Day Year: 4 16 91

TWC-0311 (Rev. 01/01/89)

White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

Please print or type (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No. 2050-0039 Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST *(Continuation Sheet)*

21. Generator's US EPA ID No. A Z D 0 7 4 4 5 2 4 2 6 | Manifest Document: 91 NC 6 | 22. Page: 2 of 2 | Information in the shaded areas is not required by Federal law.

23. Generator's Name
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040
(602) 645-8811

L. State Manifest Document Number: 00437005
M. State Generator's ID: 99904

24. Transporter 1 Company Name: Chemical Disposal Company, Inc.
25. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8
N. State Transporter's ID: 40158
O. Transporter's Phone: (602) 624-2348

26. Transporter 2 Company Name:
27. US EPA ID Number:
P. State Transporter's ID:
Q. Transporter's Phone:

28. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM	29. Containers No.	29. Containers Type	30. Total Quantity	31. Unit Wt/Vol	R. Waste No.
a. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane), Flammable Liquid, UN 1993, (F001)	x	0 0 2	D M	0 0 7 3 5	P	F001, 910100
b. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F003)	x	0 0 3	D M	0 1 3 9 3	P	F002, F003, 916940
c.						
d.						
e.						
f.						
g.						
h.						
i.						

GENERATOR

S. Additional Descriptions for Materials Listed Above
28a. 55-Gl steel drum - KRC Guide No. 27 attached
28b. 55-gl steel drum - KRC Guide No. 26 attached

T. Handling Codes for Wastes Listed Above

32. Special Handling Instructions and Additional Information
28a. RES HO #42593-37 (Drum Nos. NGS 91-032 & NGS 91-034) ymg
28b. RES HO #43151-37 (Drum Nos. NGS 91-016, NGS 91-035 & NGS 91-092)

Telephone No. (602) 236-5305 (For Emergency Response)

33. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

34. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature

Discrepancy Indication Space

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: A Z D 0 7 4 4 5 2 4 2 6 | Manifest Document No.: 9 1 N 0 7

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document Number: Nº 00437017

B. State Generator's ID: 99904

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.

6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID: 40158

D. Transporter's Phone: (602) 624-2348

7. Transporter 2 Company Name: Custom Environmental Transport

8. US EPA ID Number: D E D 9 8 0 9 1 8 8 5 8

E. State Transporter's ID: 40756

F. Transporter's Phone: (713) 930-4500

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID: 50089

H. Facility's Phone: (713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (Xylene, Toluene), Flammable Liquid, UN 1993, (F003)(F005)	0 0 3	D M	0 1 0 6 6	P	F003, F005, 910100
x	b. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F003)	0 0 5	D M	0 2 4 1 1	P	F002, F003, 916940
x	c. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F005)	0 0 2	D M	0 0 9 0 4	P	F002, F005, 916940
	d.					

J. Additional Descriptions for Materials Listed Above
11a. 55-gl steel drums - ERG Guide No. 27 attached
11b & 11c. 55-gl steel drums - ERG Guide No. 26 attached
TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)

K. Handling Codes for Wastes Listed Above: T-06

15. Special Handling Instructions and Additional Information
Site: Page, AZ
11a. RES HO #42593-37 (Drum Nos. NGS 91-014, NGS 90-051 & NGS 90-087)
11b. RES HO #43151-37 (Drum Nos. NGS 91-051, 91-037, 91-050, 91-041 & 91-043)
11c. RES HO #43151-37 (Drum Nos. NGS 91-046 & NGS 91-047)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Gordon M. DAVIS	Gordon M. Davis	04	30	91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month	Day	Year
KENNETH WYMAN	Kenneth Wyman	04	30	91

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month	Day	Year
SHIRLEY CARROLL	Shirley Carroll	05	05	91

FACILITY

19. Discrepancy Indication Space

RECEIVED
MAY 2[illegible] 1991

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date: Month	Day	Year
Karen Peters	Karen Peters	5	8	91

TWC-0311 (Rev. 01/01/89)

White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: A Z D 0 7 4 4 5 2 4 2 6 | Manifest Document No.: N 1 N 0 9

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document Number: Nº 00503333

B. State Generator's ID: 99904

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.

6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID: 40158

D. Transporter's Phone: (602) 624-2348

7. Transporter 2 Company Name: CUSTOM ENVIRONMENTAL TRANS

8. US EPA ID Number: D E D 9 8 0 9 1 8 8 5 8

E. State Transporter's ID: 40756

F. Transporter's Phone: 713)930-4500

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID: 50089

H. Facility's Phone: (713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (Xylene, Toluene), Flammable Liquid, UN 1993, (F003)(F005)	006	DM	0212	P	F003, F005 991001
x	b. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Xylene), Flammable Liquid, UN 1993, (F002)(F003)	001	DM	00460	P	F002, F005, 991001
x	c. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F002)(F003)	001	DM	00495	P	F002, F003, 916940
	d.					

J. Additional Descriptions for Materials Listed Above
11a & 11b 55-gl steel drums - ERG Guide #27 attached
11c 55-gl steel drum -0 ERG Guide #26 attached

TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)

K. Handling Codes for Wastes Listed Above: T-06

15. Special Handling Instructions and Additional Information
11a. RES HO #42593-37 (Drum Nos. NGS 91-017, 91-040, 91-044, 91-045, 91-048 & 91-049)
11b. RES HO #42593-37 (Drum No. NGS 91-015)
11c. RES HO #43151-37 (Drum No. NGS 91-053)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month Day Year
Gordon DAVIS	Gordon Davis	05 16 91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month Day Year
Russell Treu	Russell Treu	05 16 91

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month Day Year
S. MCCLENDON	S. McClendon	05 19 91

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date: Month Day Year
JOE		05 13 91

TWC-0311 (Rev. 01/01/89) White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

ROUTING AND TRANSMITTAL SLIP

Date 7/15/91

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. ~~Paula Bisson~~		7/16
2. ~~Rick Vaille~~		
3. Laura Yoshii		
4. ~~Jeff Zoellner~~		7/17
5. Latha R. H-2-2		

	Action		File		Note and Return
✓	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Request you authorize SRP to begin implementing their final sampling & analysis plan at Navajo Generating Station. This is part of the consent Agreement we signed with SRP in Jan, 91.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Latha	Phone No. X2029

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

GPO : 1987 O - 196-409

SALT RIVER PROJECT

POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

W&W-9428

via air express delivery

May 30, 1991

Lahta Rajagopalan
Compliance Officer
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Re: Final Sampling and Analysis Plan
Navajo Generating Station, Page, AZ
RCRA Docket No. 09-90-0001

Dear Ms. Rajagopalan:

Attached please find a copy of Salt River Project's (SRP) final Sampling and Analysis Plan (SAP) for Determining Potential Chromium Contamination at the Navajo Generating Station (NGS). Except as noted herein, the SAP has been revised to incorporate the EPA comments provided in the April 29, 1991 letter submitted by Ms. Peggy Garties.

We are including a summary of our response to the EPA comments in this cover letter to facilitate your review. We have broken down our responses to EPA comments into two sections; responses to comments under the "general comments" and "specific comments" headings that were documented in Ms. Garties April 29, 1991 letter. Since Ms. Garties had identified the "general comments" as the important comments to address, we include a response to each comment under this heading. In response to Ms. Garties's "specific comments" we have only provided responses to comments that have not been addressed as recommended in the EPA comments. In these cases we are documenting our rationale for departing from the EPA recommendations. All other comments were addressed as requested in the EPA comments.

We have included an updated schedule in the final SAP that identifies the commencement of the field work in early July. The date for commencing field work is subject to change depending upon availability of the drilling contractor and Brown and Caldwell Consultants. As required, SRP will notify the EPA in writing at least 14 days prior to their commencement of the sampling activities so that you may coordinate an oversight visit.

We are hoping to obtain EPA approval for the final SAP as soon as possible so that we may initiate the sampling program. I will be in the San Francisco area on June 17th and, if possible, would like to meet with you in order to finalize EPA's approval of the SAP. Please contact me at (602) 236-2685 to coordinate the meeting or if you have any questions or comments.

Sincerely,

Dennis H. Shirley
Sr. Staff Scientist
Environmental Services Department

DHS:dg
Attachments

cc: Jeffrey Zelikson
Director, Arizona, Nevada and Pacific Section (H-2-2)
Hazardous Waste Management Division
U. S. EPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Director, Radioactive & Hazardous Waste Section
Navajo EPA
P. O. Box 308
Window Rock, AZ 86515

SALT RIVER PROJECT'S RESPONSE TO EPA COMMENTS ON THE DRAFT SAMPLING AND ANALYSIS PLAN, PARTS A AND B FOR DETERMINING POTENTIAL CHROMIUM CONTAMINATION AT THE NAVAJO GENERATING STATION

Response to EPA General Comments:

1) The EPA has recommended that all soil and groundwater samples be analyzed for hexavalent chromium instead of total chromium. Hexavalent chromium was recommended "since the purpose of the sampling is to detect contamination from releases of Cr+6, and the proposed action levels to be used in evaluation of the site are for Cr+6". Ms. Peggy Garties and Mr. Matt Hagemann of EPA Region IX Hazardous Waste Management Division provided further clarification by stating that the proposed action levels in the Consent Agreement and Final Order (CA/FO) are for hexavalent chromium which represent the EPA recommended exposure levels of 400 mg/kg Cr+6 in soils and 0.05 mg/l Cr+6 in drinking water.

   After discussions with Ms. Garties, SRP has made the following revisions to the SAP. All soil samples collected in this investigation will be analyzed for total chromium via EPA Method 6010. Any samples that are determined to have greater than 400 mg/kg total chromium will be analyzed for hexavalent chromium via EPA Method 7196. All groundwater samples collected in the investigation will be analyzed for hexavalent chromium via EPA Method 7196. The SAP revisions are found in section 1.0 (page 1-1), section 3.4 (page 3-13), and section 5.2 (page 5-2).

   EPA Method 7196 was specified for the hexavalent chromium test method rather that EPA Method 7197 as suggested in the EPA comments. The EPA 7196 method was selected because Enseco-CRL, the analytical laboratory specified in the SAP, and all other analytical labs we contacted did not perform the EPA Method 7197.

2) In response to EPA comments that fewer samples could be collected in sampling sites within the Ash Disposal Area, the final SAP has been revised accordingly. The revised SAP specifies the collection of approximately 30 samples from 15 random locations at site 1 and approximately 40 samples from 20 random locations at site 2 in the Ash Disposal Area. The revisions to the SAP are described in section 3.3.1.5 (page 3-12) and shown in figures 23 and 24 in Appendix A. The individual samples will by combined to form composite samples as described in section 5.2.2 (page 5-2). As also suggested by the EPA, fewer individual samples will be combined to form the composite samples. It is anticipated that no more than six individual samples will be combined per composite sample.

3) In the EPA comments on the draft SAP, it was suggested that a field test kit might be used for the real-time analysis of hexavalent chromium in soil samples. EPA suggested that this might allow for a reduction in the number of samples to be sent to the laboratory or allow location of contaminated areas of soil within larger areas. On behalf of SRP, Brown & Caldwell Consultants (BCC) researched possible field testing equipment for hexavalent chromium. Four alternatives were evaluated.

Many laboratory companies offer test strips for detecting ions and compounds quickly in the field using a dip and read method. BCC found test strips available for chromium (II) and total chromium but none for hexavalent chromium.

There are some colorimetry field test kits available for hexavalent chromium testing. The colorimetry kit investigated by BCC was reported to work well for water samples, but had limited applications for soils. The difficulty for conducting field testing of soil samples relates to the need for sample preparation. For example, prior to colorimetric analysis, soil samples must be prepared via procedures that require drying, grinding, and weighing the solid to a uniform mass of fine powder. Equipment to dry and grind the samples is not portable. Additionally, drying and grinding would require a significant amount of time. In this sense, the analysis of soil samples via the colorimetry test methodology does not appear to be a true field test.

There are also test kits for hexavalent chromium that utilize titration. However, for many of the same reasons explained in the proceeding paragraph, the analysis of soil samples using titrimetric testing does not seem to be practical for field use.

X-ray fluorescence (XRF) can be used in the field to measure total chromium in the soil. The instrument is portable and gives results in approximately ten minutes. The XRF detection limit is 150 parts per million total chromium. There are certain limitations, however, in using XRF field testing equipment. In the first place, the XRF equipment measures total chromium rather than hexavalent chromium. Additionally, the XRF equipment provides semi-quantitative measurements of chromium concentration. For these reasons, the XRF was not chosen for field testing of hexavalent chromium in soils in this investigation.

4) In response to EPA comments about monitor well screen lengths, estimated well depths and screening intervals for the proposed groundwater monitoring wells are provided in Table 3-2 (page 3-14) of the final SAP. Please note that the screen lengths estimated for these wells is 20 feet or less.
The actual well construction will depend upon the thickness of Carmel Formation at each location. Well construction plans, as described in section 4.3 (pages 4-3 through 4-4), specify that the screened interval will extend from approximately five foot below grade to within five feet of the Carmel Formation/Navajo Sandstone contact.

The wells will be screened throughout the entire interval of the Carmel Formation because our experience has shown that there is very little water and flow in the consolidated rock units of the Carmel Formation. For example, other wells having longer

screened intervals in the Carmel Formation frequently will pump dry in minutes at one gallon per minute discharge and require days to recover to static water levels. Under these conditions, SRP considers that the maximum screen length possible should be incorporated into the monitoring strategy so that the wells may provide sufficient groundwater for sampling.

Response to EPA Specific Comments:

Item 1 (page 2 of EPA Comments) -- As previously stated, the final SAP proposes using EPA Method 7196 for the analysis of hexavalent chromium in soil and groundwater samples.

Item 6 (page 2 of EPA Comments) -- The EPA has recommended that cuttings generated from the drilling of the soil sampling borings be stored in sealed, labeled drums pending the results of laboratory analysis. Furthermore, EPA has stated that the location where the soil cuttings will be stored should be specified. SRP does not agree that the soil cuttings should be containerized. Unless there is an obvious sign of soil contamination, such as discoloration, SRP proposes to backfill the borings with the soil cuttings. We believe this is an adequate and practical step to take since there is no available information to indicate the presence of soil contamination. The information that is available, including the results of the sampling conducted by EPA during the November, 1988 site inspection and soil sampling and analysis conducted by SRP, has in fact shown that the level of chromium in soils is less than the maximum contaminant level for the chromium toxicity characteristic. If any suspected soil contamination is encountered (e.g. observations of soil discoloration), SRP will store the soil cuttings in sealed, labeled drums and have the material analyzed for TCLP metals to characterize the cuttings for disposal. The drums will be stored at the 90 day central accumulation area pending the results of the TCLP analysis.

Item 7 (page 3 of EPA comments) -- The EPA suggests that boreholes backfilled with bentonite and soil cuttings will not adequately plug the boring because the clay will not swell properly given the presence of dry materials at the site. SRP agrees with this point and will hydrate the bentonite by placing 1 gallon of water per foot of bentonite pellets placed in the borehole. EPA further recommends abandoning soil borings with a cement-bentonite grout mixture rather than using bentonite and soil cuttings. As previously stated, SRP believes the soil cuttings may be placed in the borehole and contends that the soil cuttings mixed with bentonite flakes in addition to five feet of hydrated bentonite pellets placed in the bottom of the borehole will adequately plug the holes and preclude any vertical migration of perched water from the Carmel Formation to the underlying unsaturated Navajo Sandstone.

Item 8 (page 3 of EPA comments) -- Comments concerning the appropriate screened interval have previously been addressed. The EPA, however, raises the point that if detectable results of chromium are found, then separate perched zones should be screened within each well site. SRP does not agree that the presence of "detectable" concentrations of chromium should necessitate depth specific monitoring in the Carmel Formation. Rather, SRP believes the requirement for additional groundwater monitoring should be evaluated based on the level of

chromium detected relative to the EPA-recommended exposure limit of 0.050 mg/l in water in addition to site specific factors and existing background levels. Based on this evaluation, the need for any additional groundwater monitoring will be proposed to the EPA by recommendation in the Investigation Report.

Items 13, 15 and 16 (pages 4 and 5 of EPA comments) -- The EPA comments in these sections reference CLP protocol. Although we agree with the comments in general, please note that CLP protocol will not be used in this sampling and analysis program. Instead, we will be following SW-846 protocol. SW-846 dictates the lab control samples as stated in Section 5.3.1.1 and 5.3.1.3 of this SAP.

INSPECTION REPORT
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 9
TOXICS AND WASTE MANAGEMENT DIVISION
WASTE COMPLIANCE BRANCH

Purpose: RCRA CEI Investigation

Facility: Salt River Project
Navajo Generating Station
Navajo Nation
Page, Arizona 86040

EPA ID Number: AZD0744552426

Report Number: E(88)I102

Date of Investigation: November 14-15, 1988

EPA Investigators: William J. Weis III
Environmental Scientist
(415) 974-9811

Donn Zuroski
Geologist
(415) 974-8591

Pierre Belanger
Environmental Scientist
(415) 974-8549

Navajo Nation Representatives: Patrick Antonio, Acting Director
Environmental Protection Administration
(602) 871-6617,8,9

Arlene Luther
Environmental Specialist
(602) 871-6617,8,9

Facility Representatives: Harold C. Voepel
Plant Manager
(602) 645-8811 Ext. 212

Jerre Blecha
Superintendent of Support Services
(602) 645-8811 Ext. 474

Craig Hiserote
Chemical Supervisor
(602) 645-8811 Ext. 322

Ron F. Chapman
Purchasing and Stores Supervisor
(602) 645-8811 Ext. 537

Greg Witherspoon
Environmental Service Dept.
(602) 236-2717

Report Prepared By: William J. Weis III

INTRODUCTION

The Salt River Project Navajo Generation Station is located in Northern Arizona on the Navajo Indian Reservation, approximately 3 miles East of Page, Arizona. This facility operates three coal-fired, 800 megawatt, electrical generators.

The Navajo Generating Station, NGS, is a non-notifier TSD facility. On at least four different occasions, NGS has disposed of liquid wastes from the facility's Bearing Cooling Water Systems (BCW Systems) into an on-site surface impoundment. The volume of each BCW System is approximately 1.5 million gallons of liquid coolant/corrosion inhibitor containing chromium (D007). Based on 23 analyses supplied by the facility (Appendix I and Attachment 9), the concentration of chromate in the liquid coolant ranged between 297 and 800 mg/l.* Solid wastes with concentrations of chromium in excess of 5.0 mg/l are federal hazardous waste.

NGS is also a large quantity generator of mercury, F001, F003, F005, D001, and D002 wastes.

Chronology of Events At Navajo Generating Station

1) In 1974, the NGS Electrical Generator Unit No 1 was started up. Between 1974 and 1976, NGS utilized a non-hazardous boron nitrate compound to inhibit corrosion in the BCW System. In 1976 NGS substituted the boron nitrate compound with sodium bichromate. This compound has been used ever since.

2) In 1975, the NGS Electrical Generator Unit No 2 was started up. Boron nitrate compound was used to inhibit corrosion in this Generator's Bearing Cooling Water System for approximately one year. Since then, sodium bichromate has been used.

3) In 1976, the NGS Electrical Generator Unit No 3 was started up. Sodium bichromate has been used as a corrosion inhibitor since the start up of this unit.

* Note: To convert mg/l of chromate (CrO_4) to mg/l chromium (Cr), multiply the chromate concentration by 44.83 %.

Latha

Albuquerque, NM 87110
505-889-9777
Fax 505-889-9787

PRC

FAX TRANSMITTAL SHEET

DATE: 6-28-91

TO: Latha Rajagopalan

OFFICE: EPA - SF

FROM: Jeffrey Forbes (ABQ)

SUBJECT: Ariz. borehole abandonement rules (Arizona Admin. Code, Title 12, Chap. 15 / Ariz. Dept. of Water Resource)

RECIPIENT'S FAX NO.: 415-744-1433

CHG. CODE: _____

NOTES:

Latha - here are the rules we were discussing. I have also discussed this with Greg Zeloff of Layne Environmental Services, a Phoenix drilling company we work with. Soil borings do not require a permit if (1) they are < 100 ft deep, and (2) no water is encountered. In that case, he told me that non-toxic cuttings may be used to plug the hole. If water is encountered or expected, a soil boring permit must be obtained from ADWR, which costs 10^{00} & takes 2 weeks. For permitted soil borings, cement grout must be used to plug to interval from 20' - 2' below ground

3 pages to be transmitted (including cover). If you do not receive all pages, please call (505) 889-9777 as soon as possible.

Since perched water is likely in the Nav. Gen. Sta. holes, [illegible] a permit for soil borings, & plan to grout

Call me if questions. - Jeff

R12-15-813. Unattended wells

All wells, when unattended during well drilling, shall be securely covered for safety purposes, and to prevent the introduction of foreign substances into the well.

R12-15-814. Disinfection of wells

All wells from which the water to be withdrawn is intended to be utilized for human consumption or culinary purposes without prior treatment shall be disinfected before first use, as provided in Arizona Department of Health Services' Engineering Bulletins 8 and 10.

R12-15-815. Removal of drill rig from well site

A. The drilling rig shall not be removed from the well site for more than two consecutive weeks unless the well is in one of the following conditions:

1. Constructed in full conformance with these minimum construction standards, and either sealed with a water-tight cap or equipped with a pump.

2. Abandoned in accordance with R12-15-816.

B. If the drilling rig is removed from the well site for less than two consecutive weeks, the well shall be equipped with a water-tight cap.

R12-15-816. Abandonment

A. The abandonment of a well shall be accomplished through filling or sealing the well so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water.

B. A well not penetrating an aquifer shall include a surface seal which shall be accomplished as follows:

1. If the casing is removed from the top twenty feet of the well, a cement grout plug shall be set extending from two feet below the land surface to a minimum of twenty feet below the land surface, and the well shall be backfilled above the top of the cement grout plug to the original land surface.

2. If the casing is not removed from the top twenty feet of the well, a cement grout plug shall be set extending from the top of the casing to a minimum of twenty feet below the land surface, and the annular space outside the casing shall be

filled with cement from the land surface to a minimum of twenty feet below the land surface.

C. In addition to the surface seal required in subsection B:

1. A well penetrating a single aquifer system with no vertical flow components shall be filled with cement grout, concrete, bentonite drilling muds, or backfilled with cuttings from the well.

2. A well penetrating a single or multiple aquifer system with vertical flow components shall be sealed with cement grout or a column of bentonite drilling mud of sufficient volume, density, and viscosity to prevent fluid communication between aquifers.

D. Materials containing organic or toxic matter shall not be used in the abandonment of a well.

E. The owner or operator of the well shall notify the Department in writing no later than thirty days after abandonment has been completed. The notification shall include the well owner's name, the location of the well, and the method of abandonment.

R12-15-817. Exploration wells

A. Notification

1. Prior to drilling one or more exploration wells, the well owner, lessee, or exploration firm shall file a notice of intention to drill on forms provided by the Department. The notice of intention to drill may be filed for the project as a whole, in which case the drilling card shall be issued on a similar basis.

B. Construction and abandonment

1. If an exploration well which is to be left open for re-entry at a later date encounters groundwater, it shall be cased and capped in accordance with R12-15-811 and 812. The minimal length of surface seal shall be either twenty feet, or five feet into the first encountered consolidated formation, whichever is less. If no groundwater is encountered, the well shall be cased, cemented and capped in such a manner so as to prevent contamination of the well bore from the surface.

2. Exploration wells not left open for re-entry shall be abandoned in accordance with R12-15-816, subsections A through D.

C. Completion report

1. Within thirty days of project completion, the well owner, lessee, or exploration firm shall submit a project

completion report on forms provided by the Department. The report shall include:

a. The exact number of wells drilled.
b. The depth to water encountered or detected, with reference to specific wells.
c. The abandonment method utilized, or construction details if completed for re-entry.
d. Any other information which the Director may require.

R12-15-818. Minimum distance from septic system

No person shall knowingly drill a well or cause a well to be drilled within one hundred feet of any septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials, unless authorized by the Department of Water Resources.

R12-15-819. Use of well as disposal site

No well may be used as a storage or disposal site for sewage, toxic industrial waste, or other materials that may pollute the groundwater, except as authorized by the Arizona Department of Health Services.

R12-15-820. Request for variance

A. If extraordinary or unusual conditions occur during the drilling of a well at a specific well-site, a well driller may request a variance from the minimum construction standards of this article.

B. The request for variance shall be in writing and shall set forth the location of the well site, the reasons for the request, and the recommended standards to be applied. The Director may approve the request only if the well driller has demonstrated that the variance will not adversely affect other water users or the local aquifers.

R12-15-821. Special standards

If the Director determines that the literal application of the minimum well construction standards contained in this article would not adequately protect the aquifer or other water users, the Director may require that further additional measures be taken, such as increasing the length of the surface seal or the minimum distance from a septic system.

ARIZONA REVISED STATUTES, TITLE 45, CHAPTER 2

ARTICLE 10. WELLS

Article 10, consisting of §§ 45-591 to 45-604 was added by Laws 1980, 4th S.S., Ch. 1, § 86, effective June 12, 1980.

§ 45-591. Definitions

In this article, unless the context otherwise requires:

1. "Existing well" means a well which was drilled prior to the effective date of this chapter and which is not abandoned or sealed or a well which was not completed on the effective date of this article but for which a notice of intention to drill was on file with the Arizona water commission on such date.

2. "New well" means a well for which a notice of intention to drill or a permit is required pursuant to this article.

§ 45-591.01. Oil, gas, helium and geothermal wells; exemption

Wells drilled for oil, gas or helium pursuant to the provisions of title 27 are not wells as defined in this chapter. The director, by rule or regulation, may exempt exploration wells from any requirement of this article that the director determines is not necessary for the protection of groundwater. Geothermal wells drilled pursuant to the provisions of title 27 are not wells as defined in this chapter when the director finds that the rules and regulations of the oil and gas conservation commission require the reinjection of all waters associated with the geothermal resource to the producing strata.

§ 45-592. Wells in general

A. A person may construct, replace or deepen a well in this state only pursuant to this article. The drilling of a well may not begin until all requirements of this article are met.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

JUL 17 1991

Mr. Dennis Shirley
Salt River Project
P. O. Box 52025
Phoenix, AR 85072-2025

RE: Navajo Generating Station - Sampling and Analysis Plan

Dear Mr. Shirley:

This is to let you know that EPA approves the final Sampling and Analysis Plan for Navajo Generating Station, but with the exceptions listed below that have been discussed and agreed to:

1) SRP will drum all drill cuttings.
2) SRP will analyze samples for total chrome. If total chrome is over 100 mg/kg, SRP will analyze the containerized drill cuttings using TCLP.
3) SRP will begin sampling around July 17, 1991, rather than Aug. 3, 1991, as listed in the SAP.

SRP is therefore authorized to begin implementation of the sampling plan. As Latha Rajagopalan of my staff has mentioned to you, EPA's contractor, Jeff Forbes of PRC, will oversee part of the sampling, and will be on-site on July 22 and 23.

Sincerely,

Jeffrey Zelikson
Director, Hazardous
Waste Division

cc: Louise Linkin, Navajo EPA

JUL 17 1991

Mr. Dennis Shirley
Salt River Project
P. O. Box 52025
Phoenix, AR 85072-2025

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Sincerely,

Jeffrey Zelikson
Director, Hazardous
Waste Division

cc: Louise Linkin, Navajo EPA

SYMBOL	H-2-2	H-2-2	1-2	H-1-W		
SURNAME	Rajagopalan	Watsuna	Vallie	RJ LY		
DATE	7/17/91	7/17/91	7/17/91	7/17/91		

U.S. EPA CONCURRENCES OFFICIAL FILE COPY

Russian President Boris Yeltsin also granted certain Siberian energy producers

8/8/91

Power Plant OKs Tough Air Controls

By Larry B. Stammer

LOS ANGELES TIMES

The owners of a huge Arizona power plant whose emissions obscure scenic vistas at the Grand Canyon have agreed to tougher smog controls than proposed by the U.S. Environmental Protection Agency.

The agreement, to be announced today in Phoenix in Gov. Fife Symington's office, follows months of intensive negotiations with environmentalists.

The accord calls for a 90-percent reduction in visibility-impairing sulfur dioxide emissions by August 1999 at a cost of $89.6 million.

In February, the EPA — reportedly under pressure from the White House to hold down costs — said it would insist on no more than a 70-percent cut in emissions from the Navajo Generating Station, located 80 miles northeast of the Grand Canyon's South rim.

But, environmentalists, led by the Grand Canyon Trust and operators of the 2,250-megawatt plant in Page, Ariz., said the EPA has backed the compromise.

Owners of the plant agreed because the new controls, while stricter in the long run, will have a lower cost due to less restrictive interim compliance deadlines.

The agreement was hailed Wednesday as a forerunner of future efforts to protect the pristine air of the nation's national parks and wilderness areas, many of which are under a growing smog siege.

If the controls are finalized by the EPA as expected, it would mark the first time since Congress enacted the Clean Air Act in 1977 that the 14-year-old law has been invoked to specifically protect air quality in national parks and wilderness areas.

"I do not think that it abuses the word to call this agreement truly historic," said Ed Norton, president of the Grand Canyon Trust, which was one of the principal environmental negotiators of the pact.

"If the EPA adopts the . . . recommendation, it will be the first time that the agency has acted solely to protect visibility and the paramount aesthetic values of a national park," Norton said.

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Fax 505-889-9787

PRC

April 15, 1991

Ms. Peggy Garties
Work Assignment Manager
U.S. EPA Region 9
75 Hawthorne Street, S.F. CA H-2
San Francisco, CA 94105

Contract No 068-W9-0009
Work Assignment No. 112-R09030

Subject: Technical Review of Sampling and Analysis Plan
Navajo Generating Station, Page, Arizona

Dear Ms. Garties:

PRC performed a technical review of the Sampling and Analysis Plan (SAP) for the Navajo Generating Station (NGS) located near Page, Arizona. The SAP was prepared by Brown and Caldwell Consultants (BC) for Salt River Project (SRP), the operator of NGS. PRC's review evaluates the document for completeness, accuracy, technical merit, and compliance with the objectives of the Consent Agreement and Final Order and with EPA guidance documents.

The SAP was prepared in two parts, with Part A containing site background, environmental setting, and the proposed sample locations and number of samples to be collected at NGS. The draft Part A was previously reviewed by EPA, and comments on the draft version were returned to SRP in a letter from EPA dated October 24, 1990. The revised Part A reviewed here, dated February 1991, incorporates changes to the proposed sampling strategy based on EPA's comments. PRC's Statement of Work from EPA calls for a brief review of Part A, since the document has already been reviewed once. Part B of the SAP, dated March 1991, contains field sampling methods and laboratory procedures, as well as project management structure and a health and safety plan. Part B of the SAP, which had not previously been reviewed by EPA, was thoroughly reviewed by PRC.

BACKGROUND

The Navajo Generating Station is a 2235 megawatt coal-fired power plant located about four miles southeast of Page, Arizona. The plant is operated by Salt River Project (SRP), which is also a part owner of the facility. An EPA inspection during 1988 documented that at least four releases of bearing cooling water (BCW) containing sodium bichromate, a corrosion inhibiting additive, had occurred between 1982 and 1988. On each occasion, approximately 50,000 gallons of cooling water containing an estimated 500-800 mg/L concentration of sodium bichromate ($Na_2Cr_2O_7$) was drained from an above-ground tank to a concrete-lined culvert during maintenance operations. The cooling water then passed through an unlined earthen ditch to two plastic-lined surface impoundments. Chromium contamination of the soil in the unlined ditch is believed to have occurred during each release. A 3008 (a) Consent Agreement between SRP and EPA requires that SRP conduct soil and ground-water sampling at NGS to determine the extent and magnitude of chromium contamination. The results of laboratory analysis for chromium will be presented in an Investigation Report, tentatively due to EPA in November 1991. In addition to the Investigation Report, SRP must provide either (1) a certification that the closure performance standards in 40 CFR 265.111 can be met, or (2) a draft Remediation Plan designed to ensure that SRP will be able to meet the closure performance standards.

GENERAL COMMENTS

The SAP is generally well written, thorough, and concise. PRC did not note any major problems with the proposed procedures for monitoring well installation, ground-water sampling, and soil sampling. Several potential problems were observed with regard to laboratory analysis of soil and ground-water samples for chromium content. Possibly the most significant is due to the proposed analysis of the soil and ground-water samples for <u>total</u> chromium (Cr) concentrations, whereas the 400 mg/kg action level for soil specified in the Consent Agreement is for <u>hexavalent</u> chromium (Cr^{+6}). The established action level of 400 mg/kg is taken from the health-based criterion for Cr^{+6} given by EPA[1]. The health-based criterion established by EPA for trivalent chromium (Cr^{+3}) in soil is 80,000 mg/kg, a factor of 200 higher, reflecting the much lower toxicity of the trivalent form. It is quite possible that the background total Cr concentrations in many areas at NGS will exceed 400 mg/kg, even in areas where releases of chromium-containing bearing cooling water did not occur[2]. This is particularly probable in the ash disposal area, since fly-ash typically contains elevated concentrations of a variety of transition metals, including chromium[3].

Because the hexavalent chromium concentration is a much better indicator of contamination, PRC recommends that <u>hexavalent</u> chromium analysis be performed on all soil and ground-water samples, and that <u>total</u> chromium analysis be performed on ten percent of the samples. Analysis for both hexavalent and total chromium will give an indication of natural background chromium concentrations, and may help to distinguish between contaminated and uncontaminated materials. The suggested method for hexavalent chromium analysis of soil is EPA Method 3060[4] (alkaline digestion) followed by extraction using EPA Method 7197[4] (chelation-extraction) and analysis by EPA Method 7190[4] (flame atomic absorption). Ground-water samples may be analyzed for hexavalent chromium using only the latter two methods, since digestion is not necessary.

It should be noted that neither the hexavalent chromium analysis recommended here nor the total chromium analysis specified in the SAP will be directly comparable to the EP Toxicity chromium analyses previously performed by EPA following the site inspection in November 1988. The EP Toxicity method and its successor, the TCLP method, have been shown not to give good recovery of chromium from soil[5], and these methods therefore usually give lower concentrations of chromium than methods using a more aggressive digestion, such as the EPA methods mentioned above.

---

[1] U.S. EPA, 1989, Interim Final RCRA Facility Investigation Guidance, Vol.1, Table 8-7, EPA 530/SW-89-031, May 1989.

[2] The average chromium concentration of shale is approximately 423 ppm, as reported by: Hem, J.D., 1970, Study and Interpretation of the Chemical Characteristics of Natural Water, U.S. Geological Survey Water Supply Paper 1473, 2nd Ed., p.7.

[3] Warren, C.J., and M.J. Dudas, 1984, Weathering Processes in Relation to Leachate Properties of Alkaline Fly Ash, J. Environ. Qual., Vol. 13, No. 4, p. 530.

(1) [4] U.S. EPA, 1990, Test Methods for Evaluating Solid Waste, SW-846 ~~(Revision 11/90)~~ (SW-846) ONE-IN

[5] DeYong, G.D., et al, 1990, Determination of Hexavalent Chromium in Soil Samples, Proc. 11th Superfund Conference, Nov. 1990, p. 266-269.

Consideration should be given to the use of a field screening test kit for the analysis of hexavalent chromium in the soil. One such kit is available from the Hach Company (Catalog No. 24618-00) it can detect hexavalent chromium in soil at nominal concentrations as low as 0.5 ppm[5]. The use of a field screening technique could allow a substantial reduction of the number of samples being sent to the laboratory, and could enable contaminated areas of soil to be located more easily.

The number of soil samples proposed for the ash disposal areas (112 samples) appears to be excessive. The rationale for the sample grid spacing (Appendix C, Part A of the SAP) contains assumptions that are difficult to justify. For example, the assumption that the contaminated soil was deposited in a 10-foot thick layer at each of the ash disposal areas may be incorrect. If the material was instead deposited in a 5-feet thick layer covering a larger area, the calculated sample grid spacing becomes longer by a factor of 1.4, thereby reducing the number of required sample locations. Furthermore, common sense dictates that the majority of soil sampling should be conducted in the areas where the majority of the contaminated soil is believed to have been deposited (Ash Disposal Site No. 1). It makes little sense to collect 94 soil samples from Ash Disposal Site No. 2, as proposed, since most of this material is thought not to be contaminated with chromium. PRC recommends that ten sample locations be selected at each of the two ash disposal sites, and that the sample locations be determined by the simple random sampling method, as proposed for the S-13 and S-14 impoundments. Assuming two samples are collected at each location (shallow and deep), a total of 40 soil samples would be collected from the ash disposal areas. These samples may then be combined to produce composite samples, as described in Section 5.2.2, but it should not be necessary to combine so many individual samples, since only 40 samples will be collected, rather than 112 samples, as proposed in the SAP.

SPECIFIC COMMENTS

1. Section 3.1, p. 3-1, 3rd paragraph

The statement that "Samples of groundwater in the perched water zone will be collected to measure the concentration of Cr^{+6} ....." is misleading, since it is proposed that the samples be analyzed for total Cr, not Cr^{+6}.

2. Section 3.2.1.6, p. 3-5

The approximate locations from which the background soil samples will be collected should be shown on one of the maps.

3. Section 3.3.1, p. 3-6, 2nd paragraph

This paragraph needs further explanation. It is not clear how the results of previous laboratory analyses were used to estimate the number of samples necessary to characterize the soil. In addition, SRP states that "it is calculated that two (soil) samples are needed for chemical characterization." This sentence should be clarified to indicate whether this refers to two samples per sampling location, per boring, etc.

4. Table 3-1, p. 3-7

It is unclear how the sampling depths for Area A (West Plant Drainage) will be chosen within the proposed depth intervals (e.g. 8-20 feet). The means of determining the depth from which the sample is to be collected should be explicitly stated.

(6) * **Section 4.1, p. 4-1, 4th paragraph**

The SAP states that "The results of the analysis of the soil samples will dictate the disposal method of the remaining soil cuttings." The question of where the soil cuttings will be stored prior to receipt of the laboratory results needs to be addressed. It is recommended that the cuttings be stored in sealed, labelled drums during this period.

(7) * **Section 4.1.3, p. 4-3, 1st paragraph** In addition, there is a possibility that potentially contaminated soil may be mixed with the bentonite.

The proposed use of bentonite flakes and borehole cuttings to plug and abandon boreholes is not recommended. The bentonite may not swell properly to seal the borehole, given the dry materials present at the site. ~~EPA~~ recommends that boreholes be plugged and abandoned using cement-bentonite grout placed by tremie pipe, from the bottom of the borehole to the top. The addition of Bentonite to the cement admixture should be 2-5% by weight of cement content. See TEGD section 3.2.2.

(10) * **Section 4.3.1, p. 4-4, 6th paragraph** good - see Wells comment

Steel or concrete barriers should be used for construction of traffic barriers to protect the monitoring wells[6], not schedule 80 PVC pipe.

Section 4.9.2, p. 4-13 See ESD #9 As I understand, just equip. blanks needed ?

~~QC~~ samples will include both "field blanks" and "equipment rinsate samples." These two terms are often considered to be synonymous[7]. The term "field blank" should be defined, since it apparently differs from the "equipment rinsate sample."

(14) * (2) **Section 5.2.3 p. 5-3 1st paragraph**

Reference to the total chromium instrument detection limit (IDL) of 0.5 mg/kg and the chromium reporting limit of 1 mg/kg, which is twice the (IDL) should be cited. According to EPA CLP protocol[8], the contract required detection limit (CRDL) for chromium is 10 µg/L for water samples, which is converted to a CRDL of 1 mg/kg for soil samples reported on the basis of dry weight, with 1 gram of soil sample digested and diluted to 100 mL of final volume (equation on page D-8 of the CLP SOW). Generally, it is acceptable for the laboratory to obtain an IDL lower than the CRDL. Although the term "reporting limit" mentioned in Section 5.0 is not referenced in the CLP SOW, a reporting limit of 1 mg/kg, which is equivalent to the CRDL for total chromium, is acceptable.

(15) * **Section 5.3 p. 5-3 3rd paragraph** and 5.3.2 p. 5-6

It should be clearly indicated which matrix-specific QC methods apply to this project. In general, only matrix spikes and matrix duplicates are performed for inorganics analysis. (For organics, matrix spikes and matrix spike duplicates are the required QC procedures.)

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(2) [6] U.S. EPA, 1986, RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, OSWER-9950.1, ~~Page 86~~ (TEGD)

(4) [7] U.S. EPA, 1987, Data Quality Objectives for Remedial Response Activities, EPA/540/G-87/003, March 1987, Section C.6.5, page C-11.

(3) [8] U.S. EPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganics Analysis (Revision 4/89).

Section 5.3.1.1 p. 5-4 2nd paragraph

(16) Although the method of determining the control limits for the laboratory control samples based on the historical mean recovery plus or minus three standard deviation units is presented by EPA[9], control limits of 80-120% are specified by CLP procedures for all metals except Ag and Sb (EPA[8], page E-19). This range should be also observed for the chromium laboratory control sample (LCS) analysis.

Section 5.3.1.3 p. 5-6, 3rd paragraph

(17) Reference to the information presented in this paragraph should be cited for verification. The CLP SOW[8] (page E-13) mentions the use of the CRDL as the action level for determining the needed re-analysis of samples associated with contaminated blanks, not two times the reporting limit as mentioned in the first sentence of this paragraph. It should also be noted that chromium contamination is not expected to be a problem for the method blanks; therefore, when a blank is unacceptable, corrective action should be taken to obtain an acceptable blank. All affected samples should be re-analyzed per the CLP protocol.

Section 5.3.2.1 p. 5-7, 3rd paragraph

(18) The definitions of the matrix spike ("a MS is an environmental sample to which known concentrations of analytes have been added") and matrix spike duplicate ("a MSD is an environmental sample that is divided into separate aliquots, each of which is spiked with known concentrations of analytes") are confusing. In fact, MS and MSD are two split aliquots from the same environmental sample, each of which is equally spiked with known concentrations of analytes.

Please call me at (505) 889-9777 if you have any questions regarding this review.

Sincerely,

Jeffrey Forbes
Project Manager

cc: Cameron Clarke PRC-EMI
David Liu PRC-EMI

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[9] U.S. EPA, 1990, Test Methods for Evaluating Solid Waste, SW-846 (Revision 11/90), p. ONE-17.

PRC Environmental Management, Inc.

Work Product Review Checklist

QA/QC Level Q

Project/Contract No. 112-R09030	Client/Contract EPA Reg. 9		
Type * D L P R O	Title: Tech. Review of SAP, Navajo Gen. Stn.	Draft or Final:	No. of Pages: 5
Checklist/ Initiated By: J. Forbes	Rec'd by EMI / /	Review Deadline / /	Delivery Due Date 4/15/91
WA Mgr./Tech. Monitor Project Manager: Jeffrey Forbes		Date Drafted 4-12-91	Author of Work Product: Jeffrey Forbes
Editorial Reviewer (ER): DEBRA LOPEZ		Date Reviewed: 04/15/91	Signature:
Technical Reviewer (TR): JAY T. SNYDER		Date Reviewed: 04/14/91	Signature: Jay T Snyder
QC Coordinator (QCC): BOB COUCH		Date Reviewed: 4/15/91	Signature: Bob Couch

	ACCEPTABLE									CORRECTIVE ACTION NEEDED						NOT APPLICABLE			COMMENTS
	5			4			3			2			1						
	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	
Introduction			X	X	X														
Site/Project Background			X	X	X														
Validity of Data																X	X	X	
Unusual Site Conditions Studied																X	X	X	
Pertinent Discussion					X											X			
Supported Summary/Conclusions																X	X	X	
Justifiable Recommendations		X	X					X	-							X			
Tables & Figures Cited																	X	X	
Complete Reference List				X	X	X													
Appendices Attached																X	X	X	
Clear & Readable Text				X	X	X													
Overall Organization				X	X	X													
Technical Adequacy/Accuracy		X	X													X			
Tech. Complete., All Altern. Considered						X		X								X			See below
Scope of Work Plan Objectives Covered			X		X											X			
Supporting Materials Used in Tech Review?					Y											Y			TR: Please mark Y or N in column

* Work product types: D for database, L for letter, P, for plan, R for report, O for other type. Circle one.
Use commentary sheet for detailed comments.
List necessary corrective actions and continue on reverse side, if needed.

Sampling strategy needs discussion. Let's discuss. JTS

Jeff looks great

Corrective Action Completed or Not Required: _____ QCC Signature Date 4/15/91

Distribution: 1) Original and commentary sheets, if any, plus last draft to project file 2) Copy + hard copy of final version to QA/QC file
3) Copy to Tech Reviewer 4) Copy to QCC

Form QA 3

U.S. Environmental Protection Agency
Office of Waste Programs Enforcement
Contract No. 68-W9-0009

TES 12

Technical E[illegible]cement Support at Hazard[illegible] Waste Sites Zone IV[illegible] Regio[illegible], 9, and 10

prc
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PRC

April 8, 1991

Ms. Peggy Garties
Work Assignment Manager
U.S. EPA Region 9
75 Hawthorne Street, S.F. CA H-2
San Franscisco, CA 94105

Contract No 068-W9-0009
Work Assignment No. 112-R09030

Subject: Work Plan for Navajo Generating Station
RCRA Facility Compliance Oversight

Dear Ms. Garties:

PRC Environmental Management, Inc. (PRC) is pleased to submit a work plan for oversight of RCRA facility compliance activities being conducted at the Navajo Generating Station located near Page, Arizona.

If you have any questions or comments, please call me at (505) 889-9777.

Sincerely,

Jeffrey Forbes

Jeffrey Forbes
Project Manager

Enclosure

cc: Lucy Mlenar, EPA RPO
Stephen Kovash, EPA Contracting Officer (letter only)
George Pallot, PRC
Nancy Deck, EPA ZPO

Statement of Work for Contract
PRC work Assignment #
February 19, 1991

I. Title: Review of Sampling and Analysis Plan, Review of Sampling Results and Evaluation of Investigation Report Findings for Salt River Project Navajo Generating Station

II. EPA Region 9 Project Officer: Lucy Mlenar (H-2-3), 75 Hawthorne St., San Francisco, CA 94105: (415) 744-2111.

EPA Region 9 Work Assignment Manager: Peggy Garties (H-2-2), 75 Hawthorne St., San Francisco, CA 94105: (415) 744-2029.

III. Project Scope: Estimated Level of Effort: $ 7,500
Estimated Duration: 150 hours

IV. Background:

Salt River Project's Navajo Generating Station (NGS) is a coal fired electric generating station located on the Navajo Nation near Page, Arizona. An EPA inspection in 1988 revealed that chromium-contaminated bearing cooling water from the facility's cooling system had been released at least four times into surface impoundments. SRP is currently under a 3008(a) Consent Agreement which requires, among other things, that SRP conduct sampling of **soils and groundwater** in the area of the releases to determine the extent of chromium contamination which may have resulted from this activity. SRP will also perform remediation, if necessary, to meet RCRA closure standards.

This work assignment concerns the sampling and analysis activies and determination of contamination. A portion of the Sampling and Analysis Plan (known as SAP Part A) was submitted to EPA during negotiation of the Consent Agreement and has now been revised according to preliminary EPA comments. The first portion includes the Objective, Background and Rationale for Sampling Locations and Number of Samples. The second portion of the Plan (known as SAP Part B) will be submitted March 5. The second portion of the plan will contain the Field and Laboratory Methods, Project Management and Site Safety sections.

After EPA approval of the entire SAP, SRP must begin the sampling and analysis work within 60 days. An Investigation Report detailing results of the sampling must be submitted within 90 days of commencement of sampling. Depending on the results of the site investigation, SRP must either a) certify that the facility meets the closure performance standard in 265.111; or b) submit a Remediation Plan.

V. Purpose:

The purpose of this assignment is 1) to review and provide comments, on the Sampling and Analysis Plan submitted by Salt River Project, and 2) to review analytical data provided in the Investigation Report for completeness and adequacy and to evaluate the findings of the Investigation Report.

An additional task, review and evaluation of a Remediation Plan, may be necessary depending on the results of task IV.

Upon completion of this assignment, EPA should have enough information to determine the reliability of data supplied for use in characterizing the nature and extent of chromium contamination at the facility, and to determine whether the facility meets the closure performance standard as required in the Consent Agreement, or whether remediation is necessary.

VI. Statement of Work:

This assignment consists of the following tasks:

I Workplan preparation, QA/QC and project management
II Review and comment on Sampling and Analysis Plan
III Field Oversight of Sampling and Analysis
IV. Review and evaluation of the Investigation Report

The tasks will include the following:

I. Workplan preparation, QA/QC and project management
   1. Submit a workplan covering the purposes and tasks outlined in this work assignment.
   2. Include items specified in section VII.
   3. Meet with WAM as necessary.

II. Review and comment on Sampling and Analysis Plan:
   1. Technical evaluation to assess whether the plan meets the standards of Region 9 Sampling and Analysis Plan guidance, is consistent with "Test Methods for Evaluating Solid Waste" (SW-846, November 1986) and is technically sound, feasible and in accordance with accepted scientific and engineering practices.
   2. Include a brief review of Part A of the plan, and comprehensive review of Part B of the plan.
   3. Document any deficiencies that are found and make suggestions for correcting such deficiences.
   4. Be available to answer questions concerning the plan and any deficiencies.
   5. Review modified plan, if necessary.

III. Field Oversight of Sampling and Analysis Activities
   1. Coordinate with EPA and SRP to schedule site visit.
   2. Prepare field oversight strategy and schedule.

3. Conduct site visit during sampling and analysis to provide a spot check of SRP's sampling program.
4. Prepare a trip report that includes a discussion of the sampling activities at the site and assesses compliance with generally accepted engineering and scientific practices, applicable EPA procedures and the approved sampling and analysis plan.

IV. Review and evaluation of the Investigation Report:
1. Check sample results to ensure that they are accurately and completely reported in the tables and in the text.
2. Check analytical holding times.
3. Verify that sampling and analyses were done according to the sample plan, including correct sampling procedures and locations, correct sample handling, correct analytical procedures, and correct quality assurance procedures.
4. Evaluate the need for additional sampling to further characterize the type and extent of contamination found.
5. Evaluate the conclusions of the report based on a review of data presented, applicable RCRA regulations and guidance, and professional knowledge and judgment.

VII. Staffing and Management:

The Contractor shall propose hourly allocations and individual staff responsibilities for the completion of this Work Assignment. For each manager or staff person proposed for this work Assignment, the Contractor shall submit a resume describing that person's educational background and professional experience. The resume or an addendum shall describe in detail how the staff person's professional experience is relevant to his/her assigned area of responsibility for this Work Assignment. Staff assigned to the work assignment must be experienced in sampling and analysis of soils and groundwater. All Contractor staff must be approved by the Work Assignment Manager before work may begin on this Work Assignment. The Contractor shall provide the same staff as identified in the approved workplan unless specifically approved staff changes are made in writing.

VIII. Performance Schedule:

The Contractor shall propose a schedule for the completion of this Work Assignment. EPA's estimated duration of the review and comment on the Sampling and Analysis Plan is 40 hours. EPA's estimated duration of the field oversight is 40 hours. EPA's estimated duration of the review and evaluation of the Investigation Report is 50 hours.

Quick turnaround of the review of the Sampling and Analysis Plan is important in order to facilitate early commencement of the sampling. Therefore:

- The workplan should be completed as soon as possible.
- The review and comment on the Sampling and Analysis Plan should be completed within 2 weeks of submission of the Plan by EPA to the contractor.
- The target date for review and evaluation of the Investigation Report will be discussed when the Investigation Report is received.

IX. Costs:

The Contractor shall provide a detailed estimate of the cost of completing this Work Assignment. The estimate shall include costs for labor, travel and subsistence, general and administrative expenses, fee and award and other direct costs. EPA expects the tasks to take no more than 150 total hours, broken down approximately as follows:

Task I - 20 hours
Task II - 40 hours (including written comments)
Task III - 40 hours (including report preparation)
Task IV - 50 hours (including report preparation)

X. Reporting Requirements and Deliverables:

1. Workplan
2. Written comments on Sampling and Analysis Plan, including documentation of any deficiencies and specific suggestions for modifications, if necessary.
3. Trip report describing evaluation of sampling and analysis activities.
4. Report on Investigation Report findings: draft and final
5. Within thirty days of project close-out, the contractor will return all original documents borrowed for this Work Assignment to the location or persons from which they were obtained.

Items 2, 3 and 4 shall be submitted in a format suitable for direct use as EPA comments to SRP. The final written reports shall also be submitted to EPA on computer floppy discs on Wordstar 2000 format.

XI. Performance Evaluation Criteria:

In addition to the evaluation criteria contained in the general contract, the budget criteria will be evaluated on the contractor's ability to demonstrate successful efforts at saving costs on the work assignment. No added costs/hours should appear without specific approval by the EPA WAM or RPO.

XII. References:

References will include the following:

1. The Consent Agreement between SRP and EPA
2. The Sampling and Analysis Plan Parts A and B
3. The 1988 RCRA Inspection Report
4. Region 9 Sampling and Analysis Plan Guidance
5. SW-846 for sampling and analytical results (including revised chapter 11)
8. EPA's RFI Guidance Manual

SALT RIVER PROJECT
NAVAJO GENERATING STATION
PAGE, ARIZONA

RCRA FACILITY COMPLIANCE WORK PLAN

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	R09030
EPA Region	:	9
Date Prepared	:	April 8, 1991
Contract No.	:	68-W9-0009
PRC No.	:	112-R09030
Prepared by	:	PRC Environmental Management, Inc.
Project Manager	:	Jeffrey Forbes
Telephone No.	:	505-889-9777
EPA Work Assignment Mgr.	:	Peggy Garties
Telephone No.	:	415-744-2029

Approved:

Michael C. Richards
Regional Manager

George R. Pallot
Financial Manager

TABLE OF CONTENTS

LIST OF TABLES

Compliance with a Consent Agreement

PRC Environmental Managem
under Contract No. 68-W9-0009 (TES
(EPA), Region 9. The work assignme
of the Salt River Project's (SRP) Nava
Resource Conservation and Recovery

This work assignment has four
the Sampling and Analysis Plan (SAP),
and ground-water samples, and (4) rev
presents the anticipated project approach, the scheduled deliverables, the personnel required to complete these tasks, and the cost of this work assignment.

1.1 BACKGROUND

The Navajo Generating Station (NGS) is a 2235 megawatt coal-fired power plant located about four miles southeast of Page, Arizona. The plant is operated by Salt River Project (SRP), which is also a part owner of the facility. An EPA inspection during 1988 documented that at least four releases of bearing cooling water (BCW) containing sodium bichromate, a corrosion inhibiting additive, had occurred between 1982 and 1988. On each occasion, approximately 50,000 gallons of cooling water containing an estimated 500-800 mg/L concentration of sodium bichromate ($Na_2Cr_2O_7$) was drained from an above-ground tank to a concrete-lined culvert during maintenance operations. The cooling water then passed through an unlined earthen ditch to two plastic-lined surface impoundments. Chromium contamination of the soil in the unlined ditch is believed to have occurred during each release. A 3008 (a) Consent Agreement between SRP and EPA requires that SRP conduct soil and ground-water sampling at NGS to determine the extent and magnitude of chromium contamination. The results of laboratory analysis for chromium will be presented in an Investigation Report, tentatively due to EPA in November 1991. In addition to the Investigation Report, SRP must provide either (1) a certification that the closure performance standards in 40 CFR 265.111 can be met, or (2) a draft Remediation Plan designed to ensure that SRP will be able to meet the closure performance standards.

1.2 CONFLICT OF INTEREST

PRC has reviewed the requirements of this work assignment. To the best of PRC's knowledge, PRC does not have an organizational conflict of interest with the site, the activities at the site, or with any parties known to be associated with the site. Furthermore, to the best of

PRC's knowledge, none of the staff assigned to this work assignment has a personal conflict of interest with the site, activities at the site, or parties known to be associated with the site.

2.0 PROJECT APPROACH

The project approach described in this work plan is based on the scope of work outlined in the EPA statement of work and on discussions with the EPA Region 9 Work Assignment Manager (WAM), Peggy Garties, and with the EPA Regional Project Officer, Lucy Mlenar. PRC will provide overall project management support to EPA. In addition to review by the PRC project manager, all work assignment deliverables will be subjected to technical review, editorial review, and quality control review before the documents are submitted to EPA. In addition, all correspondence will be reviewed by the project manager.

Work specified by EPA is divided into four tasks. Major activities covered under this work assignment include the following:

- Task 1 - Preparation of PRC's Work Plan, QA/QC, and Project Management
- Task 2 - Review and comment on SRP's Sampling and Analysis Plan
- Task 3 - Field oversight of soil and ground-water sampling
- Task 4 - Review and comment on SRP's Investigation Report

The following sections describe the activities that will be performed to complete this work assignment. The tasks will be completed within the estimated period of performance, which extends to approximately December 31, 1991.

2.1 WORK PLAN PREPARATION, QA/QC, PROJECT MANAGEMENT (TASK 1)

PRC has prepared this work plan in accordance with TES 12 contract guidance, dated August 1990. The work plan incorporates the activities described in the Statement of Work and provides descriptions of each activity and the level of effort (LOE) hours and costs required to complete each activity. In addition to preparation of this Work Plan, Task 1 also includes quality assurance/quality control and project management tasks necessary to complete the work assignment. QA/QC tasks include PRC's three-tiered internal review process, which is applied to all deliverables. Project management will include communication with the EPA WAM and SRP personnel, coordination of PRC staff assigned to perform tasks 2-4, and completion of the Performance Evaluation Report upon completion of the project.

2.2 REVIEW AND COMMENT ON SAMPLING AND ANALYSIS PLAN (TASK 2)

PRC will perform a technical review of SRP's Sampling and Analysis Plan (Parts A and B) to determine if the plan is consistent with EPA guidance for soil and ground-water sampling. EPA has already reviewed and commented on Part A of the SAP, therefore PRC will focus on Part B, as requested by EPA in the Statement of Work. Particular attention will be paid to the proposed soil sampling locations. Technical review comments will be presented in a letter report to EPA, along with deficiencies noted in the sampling methodologies or sampling locations.

2.3 FIELD OVERSIGHT OF SOIL AND GROUND-WATER SAMPLING (TASK 3)

One PRC employee will observe and document soil and ground-water sample collection during two days of field oversight at the Navajo Generating Station. SRP has tentatively scheduled the sampling event for August 1991, pending EPA approval of the Sampling and Analysis Plan. PRC's observations and field notes will be recorded in a bound logbook, and photographs will be taken during sampling activities. The trip report will include a photolog and copies of the field notes. Sampling procedures and locations will be checked for compliance with SRP's Sampling and Analysis Plan.

If requested by EPA, PRC will collect split samples of soil or ground water for analysis by an independent laboratory. Collection of split samples, if requested by EPA, will be performed under a separate optional subtask (Task 3A) which will require allocation of additional funds for sample collection, sample shipment, laboratory analysis, and other related expenses.

2.4 REVIEW AND COMMENT ON FINAL INVESTIGATION REPORT (TASK 4)

PRC will review and comment on SRP's Investigation Report, tentatively due to EPA in early November 1991. This report will contain the analytical test results for chromium in soil and ground-water samples collected during the sampling event. Data quality will be assessed by checking sample holding times, QA/QC sample results, laboratory procedures, and comparison with the analytical results for split samples collected by PRC, if any (Task 3A). The Investigation Report will be evaluated for technical accuracy and for compliance with the stipulations of the Consent Agreement. PRC's comments on the document will be submitted to EPA in the form of a letter report which will note any deficiencies or omissions.

6.0 EXCEPTIONS TO THE WORK ASSIGNMENT OR ANTICIPATED PROBLEMS

The estimated Level of Effort (LOE) and associated costs presented in this work plan represents PRC's best estimate of the requirements necessary to perform the tasks described by EPA. PRC will review and adopt SRP's Health and Safety Plan (HASP), included in Section 7.0 of the SAP. PRC will not prepare a separate HASP. The cost estimate does not include the cost of collection and analysis of split samples (Optional Task 3A). If EPA requests that split samples be collected by PRC during field oversight, additional funds will be required.

7.0 QUALITY ASSURANCE

The quality assurance requirements for this project have been reviewed by PRC. Based on the results of this review, a project-specific quality assurance plan is not required. Because a project-specific quality assurance plan is not required, the PRC quality assurance plan, dated March 1988, will be followed. Activities defined in this work plan may be subject to a quality assurance audit conducted by PRC quality assurance staff. Audit results will be included in the appropriate monthly progress report.

8.0 COST ESTIMATE

Detailed below are PRC's anticipated LOE hours and costs for completing this work assignment during fiscal year 1991, the first option year for the RCRA portion of the TES 12 contract. Descriptions of the various costs are included in Section 9.0. Tables 1, 2, and 3 provide a breakdown of direct labor costs, other direct costs, and travel costs, repectively.

Direct Labor LOE Hours and Costs

Professional Level	LOE Hours	Cost
P4	16	$ 465
P3	8	161
P2	182	2,837
P1	0	0
Tech 2	0	0
Total LOE Hours and Cost	206	$ 3,463
Clerical	30	318
Total PRC Hours and Cost	236	$ 3,781

hundred depending on the complexity of operations. The most commonly used "overhead pools" are Fringe Benefits, Overhead, and General & Administrative Expense. Since different firms have their own "overhead pool" nomenclature, all such costs are aggregated into the indirect costs category.

FEE: Fee is the portion of a contractor's charges which is profit. Profit generally is characterized as the basic motive of business enterprise and represents a projected monetary excess realized by a contractor after deducting costs (both direct and indirect) incurred in performance of a task.

TABLE 1

LEVEL OF EFFORT HOURS PER TASK

Tasks	P4	P3	P2	P1	Total LOE[a]	Clerical	Total WA[b] Hours
1.0 Work Plan, QA/QC, Proj. Mgmt.	4	0	30	0	34	2	36
2.0 Review Sampling/Analysis Plan	4	4	40	0	48	2	50
3.0 Field Oversight and Trip Report	4	0	58	0	62	12	74
4.0 Review Investigation Report	4	4	54	0	62	14	76
TOTAL	16	8	182	0	206	30	236

Notes:

[a] Level of Effort
[b] Work Assignment

TABLE 2

ITEMIZED OTHER DIRECT COSTS

Item	Unit Cost	Estimated No. Of Units	Amount
Computer	3.75/hour	60	225
Phone	8.00/call	25	200
Copies	.08/copy	2000	160
Mail	13.00/package	10	130
Film + Developing	20.00/unit	1	20
TOTAL			$735

TABLE 3

TRAVEL PLAN

Task 1 - Work Assignment Work Plan Preparation No travel anticipated

Task 2 - Review of Sampling and Analysis Plan No travel anticipated

Task 3 - Field Oversight of Soil and Ground-Water Sampling

Origin/Destination	Purpose	No. of People	No. of Trips	No. of Days	Round Trip Airfare ($)	Car Rental	Per Diem ($)	Lodging	Estimated Total Cost ($)
Albuq.,NM /Page, AZ	Oversight	1	1	3	$300	$165 (3 days)	$78 (3 days)	$222 (3 days)	$765

Task 4 - Review of Investigation Report No travel anticipated

APPENDIX A

RESUMES OF PROJECT PERSONNEL

JEFFREY R. FORBES
Hydrogeologist
PRC Environmental Management, Inc.

SPECIALTIES

- Hydrogeology
- Geochemistry
- Analytical Chemistry
- Monitoring Network Design
- Karst Hydrology

RELEVANT EXPERIENCE

Mr. Forbes has five years of experience performing geologic and hydrologic investigations. While working at PRC, he has performed oversight work for EPA under both RCRA and CERCLA programs. Mr. Forbes is currently the Principal Investigator for EPA Region 6 oversight of a RCRA Facility Investigation (RFI) being conducted at the NASA White Sands Test Facility (WSTF) near Las Cruces, New Mexico. WSTF is a major NASA research facility whose primary mission is the development and testing of rockets, propulsion systems, and materials for use aboard spacecraft. NASA's ongoing attempts to define the extent of ground-water contaminants surrounding WSTF, primarily Freons, trichloroethylene, and rocket propellants, have resulted in the generation of many hydrogeologic reports. Mr. Forbes has been responsible for reviewing these documents for EPA in order to assess technical accuracy and completeness. In addition, Mr. Forbes has performed field oversight of NASA's ground-water monitoring and sampling program, which presently includes approximately 65 monitoring wells.

Other sites at which Mr. Forbes has participated in RFI oversight for EPA include the General Electric Apparatus Shop in Albuquerque, and the Giant Refinery near Gallup, New Mexico.

Mr. Forbes has been involved in oversight work at several CERCLA sites, including Fort Wainwright, Alaska, SUBASE Bangor in Washington, and the Sacramento Army Depot in California. Each of these military bases is the focus of a Remedial Investigation/Feasibility Study (RI/FS) to determine the extent of ground-water contamination. Mr. Forbes has reviewed numerous RI/FS Work Plans, Sampling and Analysis Plans, and Quality Assurance Project Plans for the many operable units at these sites.

Mr. Forbes has recently directed a hydrogeologic investigation at the Inhalation Toxicology Research Institute (ITRI) in Albuquerque, New Mexico. A system of sewage lagoons totaling 10 acres has contributed to nitrate contamination of the underlying aquifer. This study was conducted to estimate the shape and velocity of the nitrate plume downgradient from the lagoons. Key elements of the study included the analysis of pneumatic slug test data to determine aquifer hydraulic properties and contaminant transport modeling.

While working as a hydrogeologist in Indiana, Mr. Forbes designed and installed ground-water and surface-water monitoring networks, performed aquifer tests, data analysis and ground-water tracer studies, and collected and analyzed environmental samples from many sites, including landfills, hazardous waste sites, coal mines, construction sites, and stone quarries.

At the A.L. Taylor Superfund site (Valley of the Drums) near Louisville, Kentucky, Mr. Forbes installed monitoring wells and performed pumping tests and single well slug tests to calculate hydraulic conductivity and conducted ground-water sampling to determine the extent and character of organic solvent contamination.

Mr. Forbes participated in permit investigations at the Central Disposal Landfill in Greene County, Indiana, including aquifer testing and ground-water sampling and analysis. Routine geologic and hydrologic compliance monitoring programs were also conducted at numerous surface and underground coal mines in southwestern Indiana. During the course of this monitoring, Mr. Forbes identified an area in Indiana yielding an anomalously soft, sodium-rich ground water. The natural geochemical processes leading to the evolution of the so-called "soda water" were then investigated in detail. These interrelated processes include ion exchange, sulfate reduction, methane production, and dissolution of fluorine-containing minerals.

Mr. Forbes also assisted in the compilation of the "Hydrogeologic Atlas of Indiana" for U.S. EPA. This report contains comprehensive ground-water data for Indiana, cataloged by aquifer.

Mr. Forbes also has four years of experience in analytical chemistry while working in laboratories in Seattle, Washington. He has analyzed all types of environmental samples for major inorganic constituents, trace metals, volatile organic compounds, and stable isotopic composition, using the following analytical techniques: ICP, graphite furnace A.A., ion chromatography, gas chromatography, and mass spectrometry. He has also performed radiocarbon analyses of biological materials to determine sample age. His M.S. thesis was a paleoclimatic study based on stable carbon and oxygen isotope ratios in lake sediments.

As a result of his strong analytical chemistry background, Mr. Forbes has been asked to review laboratory analytical data from many sites, including the Martin-Marietta site near Denver, Colorado, NASA White Sands Test Facility near Las Cruces, New Mexico, and the Giant Refinery near Gallup, New Mexico.

EMPLOYMENT HISTORY

PRC Environmental Management, Inc., Albuquerque, Hydrogeologist, Nov.1989-present
Analytical Resources, Inc., Seattle, Chemist, 1989
Bellevue Community College, Bellevue, Washington, Geology Instructor, 1987-1988
University of Washington, Seattle, Research Assistant, 1984-1987
Geosciences Research Associates, Inc., Bloomington, Indiana, Hydrogeologist, 1980-1984
U.S. Geological Survey, Water Resources Division, Indianapolis, Hydrologic Asst., 1980
Indiana University Cyclotron Facility, Bloomington, Nuclear Research Technician, 1978-1979
Indiana Geological Survey, Bloomington, Geophysics Technician, 1977-1978

EDUCATION

M.S., Geological Sciences, University of Washington, Seattle, 1987
B.S., Geology, Indiana University, Bloomington, 1984

AFFILIATIONS

Certified Professional Geologist No. 638, Indiana
Hazardous Waste Management Society of New Mexico
National Speleological Society

PUBLICATIONS

Forbes, Jeffrey, 1984, Occurrence and Consequences of Naturally Soft Groundwater in Indiana, Proc. Fifth Annual Water Resources Symposium, Indiana Water Res. Assoc., J.D. Martin, ed.

BARRY S. SIMS
Environmental Engineer
Planning Research Corporation
Albuquerque, New Mexico

SPECIALTIES

- Water and Wastewater Treatment
- Ground Water and Surface Water Hydrology
- Environmental Regulatory Compliance
- Project Management
- Environmental Engineering
- Remedial Design

RELEVANT EXPERIENCE

Mr. Sims is currently an environmental engineer in PRC's Albuquerque, New Mexico office. He has seven years of experience in civil and environmental engineering design, project management, preparation of construction plans and specifications, and construction management. Mr. Sims has managed a number of civil, environmental and water resources projects and has performed engineering design studies and analyses, economic analyses, computer modeling, feasibility studies, site characterizations, regulatory permitting, and compliance monitoring.

Mr. Sims has performed technical review and oversight for EPA on a number of RCRA and CERCLA compliance actions. Mr. Sims has performed technical review of Remedial Investigation/ Feasibility Study (RI/FS) Work Plans, Sampling and Analysis Plans, Quality Assurance Project Plans, and reports for the following sites: the D.L. Mud Site in Abbeville, Louisiana; the 100-KR-4 Reactor Area at the Hanford Reserve in Hanford, Washington; Fort Wainwright in Fairbanks, Alaska; the FMC Pesticide Formulation Facility in Yakima, Washington; and Harbor Island in Seattle, Washington.

Mr. Sims has also served as an EPA resident observer at the Petro-Processors Superfund site in Baton Rouge, Louisiana. The Petro-Processor site is located within the floodplain of the Mississippi River in an old oxbow. Petrochemical waste were disposed of in several pits and lagoons from the 1970s to the 1980s. The site is currently under remediation. The remedial design consists of the installation of an extensive ground water recovery system, an activated carbon treatment system, excavation and consolidation of wastes in Bayou Baton Rouge and the construction of a clay cap. Responsibilities include review of remedial design calculations and specifications, daily observation and inspection of construction activities, review of quality control/quality assurance testing and procedures, and review of air quality monitoring data.

Mr. Sims is currently serving as PRC's project leader on oversight of a RCRA Facility Investigation (RFI) for a site in Albuquerque, New Mexico. The site has PCB and solvent contaminated soils. Oversight responsibilities include review and comment on technical documents, split sampling of soils and ground water, and observation of drilling activities and monitoring well installation. Mr. Sims also performs cost tracking and invoicing for recovery of oversight costs incurred by EPA. He is also responsible for the successful completion of several RCRA facility assessments (RFAs) for the EPA.

While a graduate assistant at the University of New Mexico Mr. Sims was involved in a project to evaluate alternative fire-fighting agents for the U. S. Air Force. The project consisted of identifying halogenated hydrocarbons (CFCs and Halons) that have low Ozone Depletion Potentials (ODPs) and low Global Warming Potentials (GWPs). Mr. Sims assisted in the design and development of a database, performed laboratory tests and conducting statistical analyses to correlate trends in the physical and chemical properties of CFCs with their ODPs and GWPs computed by atmospheric models. The intent was to develop simplified analytical techniques for calculating ODPs and GWPs as a preliminary screening of acceptable agents.

Some of the design projects Mr. Sims has managed include: design of a ground water control system to lower the water table in an area affected by seepage from an upstream dam; design of modifications to an existing surface water treatment plant; and design of an extended aeration sequencing batch reactor for treatment of wastewater from a small subdivision. Other projects

included preparation of a water utilities master plan for a large ranch and recreational complex; design and installation of a ground and surface water monitoring network to evaluate high water-table conditions on the Isleta Indian reservation; evaluation of alternatives for ground water control and storm water management; and preparation of an environmental impact assessment for a proposed ground water discharge. Some of the projects Mr. Sims has participated in include the design of water and sewer utilities and drainage structures for a large subdivision, preparation of a drainage management master plan for a 90 square mile watershed, and preparation of a development study for a 14,000 acre parcel of land. He recently completed a removal action work plan for a Navy Shipyard sewage digester tank farm and will direct removal action field efforts.

While a student intern for the City of Albuquerque Environmental Health Department, Mr. Sims assisted in conducting a survey to determine the types and quantities of hazardous and industrial wastes generated by industries in the Albuquerque area. Mr. Sims conducted site inspections and interviewed company representatives to characterize waste streams by Standard Industrial Classification (SIC) codes. Mr. Sims also developed a database for managing the survey results and performed statistical analyses.

While at New Mexico Institute of Mining and Technology (New Mexico Tech), Mr. Sims worked in the Environmental Engineering Laboratory as a technician. Mr. Sims conducted water quality analyses and bench-scale treatability studies to optimize removal of metals from a copper mill tailings pond. Mr. Sims was also a teaching assistant for a senior level course in water and wastewater treatability studies. Mr. Sims is experienced in the use of gas chromatography, atomic absorption spectrophotometry and wet chemistry techniques.

EMPLOYMENT HISTORY

Planning Research Corporation, 1989 - Present
GRAM, Inc., Part-time Marketing Assistant, 1988 - 1989
N.M. Engineering Research Institute, Part-time Research Fellow, 1989
Resource Technology, Inc., Engineering Assistant, 1985 - 1988
New Mexico Tech., Lab Technician II, 1985 - 1985
City of Albuquerque Environmental Health and Energy Department, Student Intern, 1984 - 1985
New Mexico Tech., Lab Technician, 1983 - 1984
City of Albuquerque, Parks and Recreation Department, Design and Development Division, Engineering Technician, 1976 - 1981

EDUCATION

M.S. Candidate, Civil Engineering, University of New Mexico, expected completion May, 1991
B.S., Environmental Engineering, N.M. Institute of Mining and Technology, May 1987

AFFILIATIONS

New Mexico Hazardous Waste Management Society

PUBLICATIONS

Fuentes, H.R., Sims, B.S., 1984. An Overview of Treatment Technology Currently Available for Water Pollution Control Management, Hydrologic Report No 7, NM Bureau of Mines and Mineral Resources.

DAVID L. WEST
PRC Environmental Management, Inc.

SPECIALTIES

- Hydrogeologic Investigations
- Field Sampling
- UST Site Inspections and Corrective Action
- Remedial Investigations

RELEVANT EXPERIENCE

Mr. West has 9 years of experience that has included performing geologic and hydrogeologic investigations at Superfund, underground storage tank, and RCRA facility sites. He has been responsible for soil and ground-water sampling (at all levels of protection), monitoring well installation and development, geochemical surveys, aquifer testing, soil gas investigations, field health and safety, and integration of geologic information into hydrogeologic models. Mr. West also has experience in coal, oil, and gas exploration projects.

Mr. West managed a multiphased site assessment of leaking underground storage fuel tanks at Stapleton Airport in Denver. He supervised all field efforts, including continuous drive sampling/hollow stem auger drilling, installation of several new upgradient and downgradient monitoring wells, site safety, screening of samples for organic vapors, lithologic logging of soils, and sample collection. He evaluated water quality, soil chemistry, geologic, and hydrogeologic data to interpret contaminant transport mechanisms at the site. After delineating and quantifying the extent of fuel contamination, he evaluated several potential remedial alternatives, including recovery well systems, and oversaw pilot-scale testing of soil remediation.

Mr. West also participated in implementing overall UST management programs for a number of private industry clients. This work included tank integrity testing, site characterization associated with leaking USTs, and development and implementation of site sampling programs. He also reviewed analytical data and recommended corrective action alternatives for remediating soils and ground water contaminated by leaking USTs.

For EPA Region 10, Mr. West conducted RCRA compliance evaluation inspections at four facilities, ARCO refinery, BP Alaska, Reichhold Chemicals, and Occidental Petroleum. The purpose of these inspections was to evaluate the facilities' compliance with RCRA requirements, specifically for the operation and maintenance of the ground-water monitoring systems. For each facility, Mr. West reviewed operating and monitoring data, inspected facility operations, oversaw ground-water sampling activities, collected split samples for independent analysis, and prepared a compliance evaluation report to identify any noncompliance issues.

Under the TES 12 contract with U.S. EPA, Mr. West provided technical review of CERCLA RI/FS documents submitted by responsible parties at the Martin Marietta site in Waterton, Colorado, and the Woodbury Chemical Company site in Commerce City, Colorado. For these sites, he reviewed draft remedial investigation reports to evaluate their technical adequacy and compliance with the NCP, SARA, and EPA guidance. He also prepared comment reports to identify technical deficiencies and recommend further work at the sites.

Under EPA's Superfund Innovative Technology Evaluation (SITE) program, Mr. West participated in site background collection and data analysis in preparation for the demonstration and evaluation of the Ecova Corporation's in situ biological treatment process. This process uses special strains of cultured bacteria and microorganisms naturally occurring in on-site soils and ground water for the aerobic biodegradation of contamination. The demonstration of this process will take place at the

Goose Farm Superfund site in New Jersey, and Mr. West was the site geologist to prepare for the demonstration. He directed the installation of four wells (an extraction well, a recharge well, and two monitoring wells) and ground water and soil sampling activities.

Mr. West was project hydrogeologist and field team leader for more than a year during remedial investigations at the Rocky Mountain Arsenal Superfund site in Commerce City, Colorado. He supervised drilling operations for installing and developing more than 25 monitoring wells, and he managed and trained field sampling teams in sampling soil and ground water contaminated with Army agent compounds, pesticides, volatile organic compounds, and chlorinated solvents. Mr. West also performed aquifer tests; developed geologic cross sections and contaminant distribution maps for soil chemistry and hydrogeologic interpretation; provided expertise on field equipment operations and repairs; and managed the site command post when health and safety was of prime importance.

At Air Force Plant 78 in Brigham City, Utah, Mr. West was assistant project manager and directed all field activities for Phase II, Stage 2 remedial investigations conducted under the Installation Restoration Program. The objectives of this investigation were to further characterize several areas of ground water, surface water, and soil contamination with volatile organic compounds, herbicides, and TRPH. Mr. West conducted a 75-point soil gas survey to optimize monitoring well locations; supervised the installation, development, and sampling of monitoring wells; directed air rotary drilling operations, soil logging, and soil sample collection; sampled localized creeks, drainages, and ground water in perched horizons; performed aquifer tests; and interpreted hydrogeologic and geochemical data for the final report.

Also for the U.S. Air Force, Mr. West was project hydrogeologist for a ground-water investigation at the south boundary area of Hill Air Force Base in Utah. For this project, he assisted in characterizing the site hydrogeology by performing aquifer tests, analyzing test data, and creating computer-generated response curves. He also supervised ground-water sampling activities, reviewed sampling procedures, and trained field crews in sampling techniques.

Mr. West participated in a hydrogeologic study of an oil refinery site in Nebraska. He collected ground-water samples from monitoring wells, farm wells, and residential taps to investigate and delineate a hydrocarbon plume in fractured media.

EMPLOYMENT HISTORY

PRC Environmental Management, Inc., Geologist, 1989 - Present
Hunter/Environmental Science and Engineering, Inc., Environmental Geoscientist, 1987 - 1989
Recon Exploration, Inc., Geologist/Geochemist, 1984 - 1986
Veezay Geoservice, Inc., Geologist, 1981 - 1984
West Virginia Geologic Survey, Geologist, 1981
Geological Services, Inc., Geologist, 1980 - 1981

EDUCATION

B.S., Geology, West Virginia University, 1980

AFFILIATIONS

Association of Ground Water Scientists and Engineers
National Water Well Association

ROBERT F. COUCH
Planning Research Corporation

SPECIALTIES

- Project Management
- Environmental Geology
- Geologic Investigations and Studies
- RCRA and CERCLA Compliance

RELEVANT EXPERIENCE

Mr. Couch has 16 years of experience in the management and technical direction of multidisciplinary field and laboratory geotechnical projects. He has been responsible for conducting teams of up to 55 staff and projects in excess of $25 million. Over the past 22 years, he held several diverse technical and managerial positions in the research, development, production, and environmental issues of the nuclear weapons industry, directing efforts of contractors, other government agencies, and technical personnel. He is currently a project manager in PRC's Albuquerque office and has an active Q-clearance with DOE.

Recently, Mr. Couch completed a ground-water protection plan for the Lovelace Inhalation Toxicology Research Institute on Kirtland Air Force Base, New Mexico. This plan is required by the Department of Energy's Order 5400.1 to ensure that each DOE facility has an active ground-water protection program and guarantee compliance with all local, state, and federal (including RCRA, CERCLA, and SDWA) regulations. The plan describes the facility, the ground-water conditions, potential contaminants, and the existing ground-water monitoring program.

Under PRC's RCRA and CERCLA enforcement support contracts with U.S. EPA, Mr. Couch has been participating in the review and evaluation of RCRA corrective action activities at DOE facilities in Kansas City and Hanford. Specifically, he has used his geotechnical and nuclear weapons production expertise to comment on the adequacy of RFI and CMS work plans and reports, ground-water quality assessments, sampling plans, and other documents. He has reviewed these documents to identify deficiencies and recommend further work needed to meet project objectives, RCRA requirements, and EPA guidance.

Before joining PRC, Mr. Couch completed 21 years of active military service as a nuclear weapons R&D officer. Most recently, he was responsible for managing the Air Force nuclear weapon stockpile and the associated technical requirements, weapons development, and programmatic and DOE liaison and production facility issues. His responsibilities included serving as the senior Air Force staff member on the Nuclear Weapons Council Standing Committee, the interface forum between the Departments of Energy and Defense.

As a program manager at the Defense Nuclear Agency, Mr. Couch led a team of 55 technicians, engineers, and scientists from three federal agencies and ten contractors and a $25 million program to explore underwater, subsurface, and surface environments of the Pacific Proving Ground nuclear test site environment. The objective of this program was to better understand the effects of nuclear weapons on the earth's surface. Located at Enewetak Atoll in the Marshall Islands, the project used extensive geotechnical tools to resolve basic technical issues associated with nuclear weapon craters. Mr. Couch's multidisciplinary team provided innovative offshore drilling, geophysical, and geotechnical techniques. This effort was successful because a high percentage of samples were recovered and the comprehensive laboratory analyses and studies allowed a detailed geologic framework of the test site to be established. In an earlier geologic investigation of Enewetak, Mr. Couch was the chief geologist of a geotechnical team providing site-specific geology used for contamination containment designs used in corrective measures and ground-water sampling for the radiologic cleanup of Enewetak Atoll.

Mr. Couch was the Air Force project manager for field teams working throughout the Rocky Mountain states to conduct geotechnical investigations and hydrogeologic characterizations for proposed strategic missile shelters and high explosive test sites. His responsibilities included planning research activities, teaming scientists, directing drilling and seismic crews, and ensuring environmental compliance.

For 4 years, Mr. Couch was responsible for managing a production-oriented, environmental micro-particulate laboratory. This laboratory analyzed and monitored nuclear weapon radionuclide particulate and industrial effluent in environmental and soil samples from foreign facilities as well as from the Nevada Test Site, the Pacific Proving Ground, and other DOE laboratory and production sites. He was also responsible for developing unique radioactive and high explosive particulate sampling techniques for air, soil, and anthropogenic media for analysis with microscopy tools.

During his service with the Air Force, Mr. Couch led the successful deployment of a major new nuclear warhead (W-84) in Europe, meeting cost and political schedules. This effort required strict regulatory compliance and reporting procedures of nuclear safety regulations for the weapon system, facilities, and support equipment. He also used his managerial and geotechnical skills as the prime Air Force advocate and technical manager in the successful fullscale development of the earth penetrating nuclear warhead.

EMPLOYMENT HISTORY

Planning Research Corporation, Project Manager/Geologist, 1990 - present
Office of the Assistant Secretary, Air Force (Acquisition), Chief of Nuclear Branch, 1987 - 1990
HQ Defense Nuclear Agency, Program Manager, 1984 - 1987
Joint Cruise Missile Program Office, Director Nuclear Safety/Warhead Integration, 1982 - 1984
Air Force Weapons Laboratory, Earth Phenomenology Section Chief, 1979 - 1982
McClellan Air Force Base Central Lab, Microscopy Lab Chief, 1975 - 1979
Air Force Weapons Lab, Civil Engineering Research, Geologist, 1973 - 1974
Office of Study Support, Analyst and Geographer, 1972 - 1973

EDUCATION

M.S., Geology, The Ohio State University, 1971
B.S., Geology, Capital University, 1969

AFFILIATIONS

New Mexico Hazardous Waste Society

AWARDS

Defense Superior Service Medal for Geotechnical Program Management

SELECTED PUBLICATIONS

Tremba, E.L., and B.L. Ristvet, eds, B.R. Wardlaw, T.W. Henry, J.F. Schatz, R.F. Couch, 1990. Summary of the Pacific Enewetak Atoll Crater Exploration (PEACE) Program, Defense Nuclear Agency, DNA-TR-88-289.

Tremba, E.L., R.F. Couch, and B.L. Ristvet, 1982. Enewetak Seismic Investigation (EASI) Phase I and II, New Mexico Engineering Research Institute Albuquerque, NM., NMERI-TAG-4.

Ristvet, B.L., R.F. Couch, and E.L. Tremba, 1980. Late Cenozoic Solution Unconformities at Enewetak Atoll, Geologic Society of America Abstracts with Programs, v. 12, p.510.

Couch, R.F., and D.W. Efurd, 1978. Analysis of a Rocky Flats, Colorado, Soil Sample Containing Plutonium, Open File Technical Report McClellan Central Laboratory, McClellan Air Force Base California, TR-78-61.

Couch, R.F., and others, 1975. Drilling Operations on Enewetak Atoll During Project EXPOE, (Exploratory Program on Enewetak), Air Force Weapons Laboratory, AFWL-TR-216.

JAY T. SNYDER
Hydrogeologist
PRC Environmental Management, Inc.

SPECIALTIES

- Hydrogeology
- Geophysics
- Atmospheric Sciences

RELEVANT EXPERIENCE

Mr. Snyder joined PRC in May 1990 after a four-year tour of duty in the United States Air Force where he served as a weather officer. Since joining PRC, he has been involved in a variety of projects, including RCRA Facility Assessments (RFA), RCRA Facility Investigations (RFI), and an integrated hydrogeologic study of the Inhalation Toxicology Research Institute (ITRI) in Albuquerque, New Mexico.

Mr. Snyder participated in RCRA Facility Assessment at Fort Chaffee, Arkansas, where he performed the Visual Site Inspection and prepared the final report submitted to EPA. For the Fort Wingate, New Mexico, RFA, he was involved in the regulatory history review and report preparation.

RCRA Facility Investigations in which Mr. Snyder has participated include Giant Refinery, Gallup, New Mexico, and Navajo Refinery, Artesia, New Mexico. At these sites, he provided field oversite for EPA, split sampled ground water, surface sediment, and subsurface soil, and participated in report preparation. For Martin Marietta's RFI at its NASA facility in New Orleans, he prepared the Health and Safety Plan and participated in report preparation.

At the ITRI facility in Albuquerque, New Mexico, Mr. Snyder was involved in several phases of an integrated hydrogeologic study. He participated in pneumatic slug testing of existing monitoring wells to determine hydraulic conductivity and in contaminant transport modeling to estimate the extent of migration of a nitrate plume present at the site. In addition, he performed the technical review of the document.

Prior to joining PRC, Mr. Snyder was involved in operational weather forecasting in support of over three billion dollars in assets at Langley AFB, Virginia. He was responsible for briefing the Commander, First Tactical Fighter Wing, at staff meetings and during periods of impending severe weather. In addition to operational weather, Mr. Snyder was involved in air dispersion modeling to assist in disaster preparedness contingency plans for Langley. He also served on the base Environmental Policy Committee.

Mr. Snyder has been involved in various modeling projects over the years. His thesis research involved heat flow modeling of a low temperature geothermal system in southern New Mexico. His academic training includes modeling of ground-water flow, contaminant transport, atmospheric dispersion, and numerical forecasting.

EMPLOYMENT HISTORY

PRC Environmental Management, Inc., Albuquerque, Hydrogeologist, May 1990 - present
U.S. Air Force Reserves, Barksdale AFB, LA, Reserve Weather Officer, August 1990 - present
U.S. Air Force, Langley AFB, VA, Wing Weather Officer, 1988 - 1990
Hampton University, Hampton Virginia, Instructor of Earth Sciences, 1988 - 1990
U.S. Air Force, Air Force Institute of Technology, Texas A&M University, 1987
U.S. Air Force, Officer Training School, Lackland, AFB, Texas, 1986
New Mexico State University, Las Cruces, Teaching and Research Assistant, 1982 - 1985

EDUCATION

M.S., Geology/Geophysics, New Mexico State University, Las Cruces, 1986
B.S., Meteorology, Texas A&M University, College Station, 1988
B.S., Geology, University of Wisconsin at Platteville, 1982
Further Studies in Hydrology and Environmental Engineering, Old Dominion University and Virginia Polytechnical Institute, 1989 - 1990

AFFILIATIONS

NWWA Association of Ground Water Scientists and Engineers
American Geophysical Union
New Mexico Geological Society

PUBLICATIONS

Swanberg, C.A., and Snyder, J.T., 1983, Terrestrial heat flow in New Mexico: Preliminary analysis of the private data base, EOS Transactions of the American Geophysical Union, v. 64, no. 45, p. 836.

Snyder, J.T., and Swanberg, C.A., 1984, Heat flow in the southern Mesilla Bolson, southern Rio Grande Rift, New Mexico, New Mexico Geological Society Spring Conference Abstracts, p. 27.

Snyder, J.T., 1986, Heat flow in the southern Mesilla Basin with an analysis of the East Potrillo geothermal system, Doña Ana County, New Mexico, M.S. thesis, NMSU, 252 pp.

XUANNGA PHAM-MAHINI
Environmental Toxicologist
PRC Environmental Management, Inc.

SPECIALTIES

- Toxicology/Epidemiology
- Fate/Transport Modelling
- Statistical Analysis
- Risk Assessment
- RI/FS Evaluation
- Technology Transfer

RELEVANT EXPERIENCE

Ms. Xuannga Pham-Mahini has four years of experience in environmental health and science, including toxicology, epidemiology, biostatistics, and risk assessment. At PRC-EMI, Ms. Pham-Mahini has contributed significantly to risk assessments and health-based cleanup goal development for several Superfund Sites. These include the Hassayampa Site in Arizona, FMC Fresno Site in California (EPA Region IX), Lee Chemical Site in Missouri (EPA Region VI), and FMC Yakima Site in Washington (EPA Region X). Her background in toxicology, statistical analysis, and computer programming allows her to perform all the essential steps of the risk assessment process, namely data evaluation, exposure assessment, toxicity assessment, and risk characterization.

For the EPA Region IX, Ms. Pham-Mahini was involved in the Hassayampa risk assessment. She assisted the PRC Project Manager in directing staff while she was responsible for the detection limit and monitoring data evaluation, exposure assessment, VOC air emission modelling, health risk calculation and interpretation, and finally report preparation.

For the FMC Fresno Superfund Site, Ms. Pham-Mahini reviewed and finalized the risk assessment and health-based cleanup goal development reports. Currently, she assisted the EPA Remedial Project Manager in reviewing the Feasibility Study report for input into the Record of Decision (ROD) for the Site. Ms. Pham-Mahini is also a member of several PRC teams reviewing different RI/FS and risk assessment documents for the Hanford, Fort Wainwright (Alaska), Travis AFB, and Valley Wood Preserving Sites.

In addition, Ms. Pham-Mahini has performed several volatile organic compounds (VOC) air emission modelling projects, using contaminated soil data. She has also calculated the associated health risks for different EPA projects which include the Army Depot in Sacramento, Treasure Island in San Francisco, and Aiea Laundry Area in Hawaii. She also has a working knowledge of several soil, water, and air models, both analytical and numerical.

For the EPA Region VI, Ms. Pham-Mahini contributed to the risk assessment for the Lee Chemical Site. She performed the statistical analysis of the data, identified the fate and transport characteristics of contaminants of concern, and finally calculated the exposure intakes and human health risks. This project was completed within a short time requirement period and received a score of 5.0 from the EPA.

For the EPA Region X at FMC Yakima, Ms. Pham-Mahini developed the state-of-the-art cleanup goals for concrete contaminated with pesticides. These goals were derived using wipe sample tests and site-specific exposure conditions. The results were well received by the EPA and presented at

the 30th Annual Meeting of the Society of Toxicology at Dallas. Ms. Pham-Mahini's report was also summarized in the ROD for the Site and was favorably reviewed by the EPA Headquarters.

Under the NAVY CLEAN contract, Ms. Pham-Mahini reviewed all laboratory analytical data of the two phases of the Tank Removal and Well Installation Activities at the Moffett Naval Air Station (NAS) Site. She also prepared the Statement of Work (SOW) and Quality Assurance Project Plan (QAPjP) and performed the technology evaluation for the ongoing on-site soil treatment studies at this naval facility.

In an effort to locate available technical information sources for the San Francisco Office, Ms. Pham-Mahini has acquired access to several electronic technical databases/bulletin boards available from the EPA and other agencies. With this expertise, she provided pertinent references and technical information to several key projects.

EMPLOYMENT HISTORY

PRC Environmental Management, Inc., San Francisco, Environmental Toxicologist, 1990-present.
Western Consortium for Public Health, Berkeley, Toxicologist Consultant/Database Manager, 1987-1990.
University of California, Berkeley, School of Public Health, Postgraduate Researcher/Research Assistant, 1987-1989.
University of California, Davis, Department of Occupational & Environmental Medicine, Technical Consultant, 1989-1990.
State of California, Department of Health Services, Research Assistant, (Reproductive and Cancer Hazard Assessment Section, 2/89-4/89; Genetic Disease Branch, 8/88-12/88; Epidemiological Study Section, 7/87-5/88).

EDUCATION

M.P.H., Environmental Toxicology, University of California, Berkeley, Berkeley, 1989.
B.A., Biochemistry, University of California, Berkeley, Berkeley, 1987.

AFFILIATIONS

Genetic and Environmental Toxicology Association (GETA), California.

PUBLICATIONS/PRESENTATIONS

X. Pham-Mahini et al., 1991, Developing Health-based Cleanup Concentrations for Contaminated Concrete at the FMC Pesticide Site in Yakima, WA. Poster presented by Ms. Susan Turnblom (PRC Seattle) at the 30th Annual Meeting of the Society of Toxicology, February 25th - March 1st, Dallas, TX, 1991.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

APR 2 9 1991

Dennis Shirley
Water Quality/Waste Management Division
Salt River Project
P.O. Box 52025
Phoenix, AZ 85072-2025

Dear Dennis:

Enclosed are EPA's comments on the Draft Sampling and Analysis Plan, Parts A & B submitted by Salt River Project. As I mentioned in our phone conversation of April 25, the plan looks generally very good and most of our comments are on procedural details which should be quite easy to address. The important comments, which we discussed, are contained in the first section on general comments.

As we discussed on the phone, this revision should produce a final Sampling and Analysis Plan if all EPA comments are adequately addressed. You will also be able to propose a schedule for the sampling activities, and we may begin to coordinate an oversight visit to Navajo Generating Station during sampling.

We will expect the plan within thirty days of your receipt of these comments. If you have any questions before finalizing the plan, please call me at (415) 744-2029.

Sincerely,

Peggy Garties

Peggy Garties
Compliance Officer

encl.

cc: Louise Linkin, Navajo EPA

**Comments on the Sampling and Analysis Plan (SAP)
for Determining Potential Chromium Contamination
at the Navajo Generating Station
(Draft Part A, February 1991)
(Draft Part B, March 1991)**

General Comments:

1. The SAP proposes analysis of soil and groundwater samples for total chromium (Cr) concentrations. Analysis for hexavalent chromium (Cr +6) would be more appropriate, since the purpose of the sampling is to detect contamination from releases of Cr+6, and the proposed action levels to be used in evaluation of the site are for Cr+6.

EPA recommends that hexavalent chromium analysis be performed on all soil and groundwater samples, and that total chromium analyses be performed on at least 10 percent of the samples. (This should give an indication of natural background chromium concentrations and may help to distinguish between contaminated and uncontaminated materials.)

The suggested method for Cr+6 evaluation is:
EPA method 3060 - alkaline digestion (soils) and
EPA method 7197 - chelation & extraction (soils and groundwater)

2. Collection of 112 samples is now proposed for the Ash Disposal Areas. In addition, the majority of samples (94) are proposed for the area where the smaller amount of contaminated soil is believed to have been deposited (Ash Disposal Site 2) which does not seem to make sense.

EPA recommends that fewer samples could be collected in the Ash Disposal Areas, and that sample locations be selected by the simple random sampling method as proposed for the S-14 and S-13 impoundments. (For example if 15-20 locations are chosen in each ash disposal area, assuming two samples are collected at each location, a total of 60-80 samples would be collected from the ash disposal areas.) Samples may then be composited as described in section 5.2.2, but it should not be necessary to combine so many individual samples as proposed in the SAP.

3. EPA suggests consideration of use of a field test kit for analysis of Cr+6 in soil. This could allow for a reduction in the number of samples being sent to the laboratory, as discussed above, and allow location of contaminated areas of soil within larger areas.

4. Approximate well depths and screening intervals are not given for the proposed wells. However, in looking at the construction of existing wells and the thickness of the Carmel formation, the screened intervals could be as long as 30 feet. RCRA

laboratory results needs to be addressed. It is recommended that the cuttings be stored in sealed, labeled drums during this period.

7. {Section 4.1.3, p.4-3, 1st paragraph} The proposed use of bentonite flakes and borehole cuttings to plug and abandon boreholes is not recommended. The bentonite may not swell properly to seal the borehole, given the dry materials present at the site. In addition, there is a possibility, that potentially contaminated soil may be mixed with the bentonite. EPA recommends that boreholes be plugged and abandoned using cement-bentonite grout placed by tremie pipe, from the bottom of the borehole to the top. The addition of Bentonite to the cement admixture should be 2-5% by weight of cement content. See TEGD, Section 3.2.2.

8. {Section 4.3, P. 4-3} Monitoring wells screened from the bottom to within 5 feet of the surface could have screened interval as long as 33 feet. The TEGD and SW-846 Chapter 11 recommend keeping screen lengths to a minimum to avoid dilution. Screen lengths as proposed by SRP could intercept multiple perched zones, which could result in dilution of a plume.

EPA recommends that if detectable results of chromium are found, separate perched zones should be screened, per well site, by separate wells with screen lengths of 5-10' maximum.

9. {Section 4.3.1, p.4-4, 6th paragraph} Steel or concrete should be used for construction of traffic barriers to protect the monitoring wells, not schedule 80 PVC pipe.

10. {Section 4.3.1, P. 4-3} The SAP states that monitoring wells will be constructed according to state regulations; they must also meet Federal EPA standards as outlined in the TEGD or Chapter 11 of SW-846. A schematic of well construction should be included, and TEGD specifications, including the following, should be observed:

a) Wells should be surveyed by a licensed surveyor for:
   1) top of inner well casing (within + or - 0.01 ft)
   2) ground surface elevation (+ or - 0.01 ft)
   3) surveyors pin on concrete apron (+ or - 0.01 ft.)
   4) top of protective steel casing (+ or - 0.01 ft.)

b) The well development and sampling section should include:
   1) Provisions to measure water levels before each sampling event (depth to water, depth to bottom of well, to within 0.01' from datum at top of casing)
   b) two hour time limit for recovery - samples should be collected as soon as volume is sufficient if total recovery is greater than two hours.
   c) retesting for pH <u>after</u> sampling.

16. (Section 5.3.1.3 p.5-6, 3rd paragraph) Reference to the information presented in this paragraph should be cited for verification. The CLP SOW (page E-13) mentions the use of the CRDL as the action level for determining the needed re-analysis of samples associated with contaminated blanks, not two times the reporting limit as mentioned in the first sentence of this paragraph. It should also be noted that chromium contamination is not expected to be a problem for the method blanks; therefore, when a blank is unacceptable, corrective action should be taken to obtain an acceptable blank. All affected samples should be re-analyzed per the CLP protocol.

17. (Section 5.3.2.1 p. 5-7, 3rd paragraph) The definitions of the matrix spike ("a MS is an environmental sample to which known concentrations of analytes have been added") and matrix spike duplicate ("a MSD is an environmental sample that is divided into separate aliquots, each of which is spiked with known concentrations of analytes") are confusing. In fact, MS and MSD are two split aliquots from the same environmental sample, each of which is equally spiked with known concentrations of analytes.

REFERENCES:

1. U.S. EPA, 1990, Test Methods for Evaluating Solid Waste, SW-846 (SW-846).

2. U.S. EPA, 1986, RCRA Groundwater monitoring Technical Enforcement Guidance Document, OSWER-0050.1 (TEGD).

3. U.S. EPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganics Analysis, Revision 4/89 (CLP SOW).

4. U.S. EPA, 1987, Data Quality Objectives for Remedial Response Activities, EPA/540/G-87/003, March 1987.

PRC Environmental Management, Inc.
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April 15, 1991

Ms. Peggy Garties
Work Assignment Manager
U.S. EPA Region 9
75 Hawthorne Street, S.F. CA H-2
San Francisco, CA 94105

Contract No 068-W9-0009
Work Assignment No. 112-R09030

Subject: Technical Review of Sampling and Analysis Plan
Navajo Generating Station, Page, Arizona

Dear Ms. Garties:

PRC performed a technical review of the Sampling and Analysis Plan (SAP) for the Navajo Generating Station (NGS) located near Page, Arizona. The SAP was prepared by Brown and Caldwell Consultants (BC) for Salt River Project (SRP), the operator of NGS. PRC's review evaluates the document for completeness, accuracy, technical merit, and compliance with the objectives of the Consent Agreement and Final Order and with EPA guidance documents.

The SAP was prepared in two parts, with Part A containing site background, environmental setting, and the proposed sample locations and number of samples to be collected at NGS. The draft Part A was previously reviewed by EPA, and comments on the draft version were returned to SRP in a letter from EPA dated October 24, 1990. The revised Part A reviewed here, dated February 1991, incorporates changes to the proposed sampling strategy based on EPA's comments. PRC's Statement of Work from EPA calls for a brief review of Part A, since the document has already been reviewed once. Part B of the SAP, dated March 1991, contains field sampling methods and laboratory procedures, as well as project management structure and a health and safety plan. Part B of the SAP, which had not previously been reviewed by EPA, was thoroughly reviewed by PRC.

BACKGROUND

The Navajo Generating Station is a 2235 megawatt coal-fired power plant located about four miles southeast of Page, Arizona. The plant is operated by Salt River Project (SRP), which is also a part owner of the facility. An EPA inspection during 1988 documented that at least four releases of bearing cooling water (BCW) containing sodium bichromate, a corrosion inhibiting additive, had occurred between 1982 and 1988. On each occasion, approximately 50,000 gallons of cooling water containing an estimated 500-800 mg/L concentration of sodium bichromate ($Na_2Cr_2O_7$) was drained from an above-ground tank to a concrete-lined culvert during maintenance operations. The cooling water then passed through an unlined earthen ditch to two plastic-lined surface impoundments. Chromium contamination of the soil in the unlined ditch is believed to have occurred during each release. A 3008 (a) Consent Agreement between SRP and EPA requires that SRP conduct soil and ground-water sampling at NGS to determine the extent and magnitude of chromium contamination. The results of laboratory analysis for chromium will be presented in an Investigation Report, tentatively due to EPA in November 1991. In addition to the Investigation Report, SRP must provide either (1) a certification that the closure performance standards in 40 CFR 265.111 can be met, or (2) a draft Remediation Plan designed to ensure that SRP will be able to meet the closure performance standards.

GENERAL COMMENTS

The SAP is generally well written, thorough, and concise. PRC did not note any major problems with the proposed procedures for monitoring well installation, ground-water sampling, and soil sampling. Several potential problems were observed with regard to laboratory analysis of soil and ground-water samples for chromium content. Possibly the most significant is due to the proposed analysis of the soil and ground-water samples for <u>total</u> chromium (Cr) concentrations, whereas the 400 mg/kg action level for soil specified in the Consent Agreement is for <u>hexavalent</u> chromium (Cr^{+6}). The established action level of 400 mg/kg is taken from the health-based criterion for Cr^{+6} given by EPA[1]. The health-based criterion established by EPA for trivalent chromium (Cr^{+3}) in soil is 80,000 mg/kg, a factor of 200 higher, reflecting the much lower toxicity of the trivalent form. It is quite possible that the background total Cr concentrations in many areas at NGS will exceed 400 mg/kg, even in areas where releases of chromium-containing bearing cooling water did not occur[2]. This is particularly probable in the ash disposal area, since fly-ash typically contains elevated concentrations of a variety of transition metals, including chromium[3].

Because the hexavalent chromium concentration is a much better indicator of contamination, PRC recommends that <u>hexavalent</u> chromium analysis be performed on all soil and ground-water samples, and that <u>total</u> chromium analysis be performed on ten percent of the samples. Analysis for both hexavalent and total chromium will give an indication of natural background chromium concentrations, and may help to distinguish between contaminated and uncontaminated materials. The suggested method for hexavalent chromium analysis of soil is EPA Method 3060[4] (alkaline digestion), followed by extraction using EPA Method 7197[4] (chelation-extraction) and analysis by EPA Method 7190[4] (flame atomic absorption). Ground-water samples may be analyzed for hexavalent chromium using only the latter two methods, since digestion is not necessary.

It should be noted that neither the hexavalent chromium analysis recommended here nor the total chromium analysis specified in the SAP will be directly comparable to the EP Toxicity chromium analyses previously performed by EPA following the site inspection in November 1988. The EP Toxicity method and its successor, the TCLP method, have been shown not to give good recovery of chromium from soil[5], and these methods therefore usually give lower concentrations of chromium than methods using a more aggressive digestion, such as the EPA methods mentioned above.

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[1] U.S. EPA, 1989, Interim Final RCRA Facility Investigation Guidance, Vol.1, Table 8-7, EPA 530/SW-89-031, May 1989.

[2] The average chromium concentration of shale is approximately 423 ppm, as reported by: Hem, J.D., 1970, Study and Interpretation of the Chemical Characteristics of Natural Water, U.S. Geological Survey Water Supply Paper 1473, 2nd Ed., p.7.

[3] Warren, C.J., and M.J. Dudas, 1984, Weathering Processes in Relation to Leachate Properties of Alkaline Fly Ash, J. Environ. Qual., Vol. 13, No. 4, p. 530.

[4] U.S. EPA, 1990, Test Methods for Evaluating Solid Waste, SW-846 (Revision 11/90), p. ONE-17.

[5] DeYong, G.D., et al, 1990, Determination of Hexavalent Chromium in Soil Samples, Proc. 11th Superfund Conference, Nov. 1990, p. 266-269.

Consideration should be given to the use of a field screening test kit for the analysis of hexavalent chromium in the soil. One such kit is available from the Hach Company (Catalog No. 24618-00) it can detect hexavalent chromium in soil at nominal concentrations as low as 0.5 ppm[5]. The use of a field screening technique could allow a substantial reduction of the number of samples being sent to the laboratory, and could enable contaminated areas of soil to be located more easily.

The number of soil samples proposed for the ash disposal areas (112 samples) appears to be excessive. The rationale for the sample grid spacing (Appendix C, Part A of the SAP) contains assumptions that are difficult to justify. For example, the assumption that the contaminated soil was deposited in a 10-foot thick layer at each of the ash disposal areas may be incorrect. If the material was instead deposited in a 5-feet thick layer covering a larger area, the calculated sample grid spacing becomes longer by a factor of 1.4, thereby reducing the number of required sample locations. Furthermore, common sense dictates that the majority of soil sampling should be conducted in the areas where the majority of the contaminated soil is believed to have been deposited (Ash Disposal Site No. 1). It makes little sense to collect 94 soil samples from Ash Disposal Site No. 2, as proposed, since most of this material is thought not to be contaminated with chromium. PRC recommends that ten sample locations be selected at each of the two ash disposal sites, and that the sample locations be determined by the simple random sampling method, as proposed for the S-13 and S-14 impoundments. Assuming two samples are collected at each location (shallow and deep), a total of 40 soil samples would be collected from the ash disposal areas. These samples may then be combined to produce composite samples, as described in Section 5.2.2, but it should not be necessary to combine so many individual samples, since only 40 samples will be collected, rather than 112 samples, as proposed in the SAP.

SPECIFIC COMMENTS

Section 3.1, p. 3-1, 3rd paragraph

The statement that "Samples of groundwater in the perched water zone will be collected to measure the concentration of Cr^{+6} ....." is misleading, since it is proposed that the samples be analyzed for total Cr, not Cr^{+6}.

Section 3.2.1.6, p. 3-5

The approximate locations from which the background soil samples will be collected should be shown on one of the maps.

Section 3.3.1, p. 3-6, 2nd paragraph

This paragraph needs further explanation. It is not clear how the results of previous laboratory analyses were used to estimate the number of samples necessary to characterize the soil. In addition, SRP states that "it is calculated that two (soil) samples are needed for chemical characterization." This sentence should be clarified to indicate whether this refers to two samples per sampling location, per boring, etc.

Table 3-1, p. 3-7

It is unclear how the sampling depths for Area A (West Plant Drainage) will be chosen within the proposed depth intervals (e.g. 8-20 feet). The means of determining the depth from which the sample is to be collected should be explicitly stated.

Section 4.1, p. 4-1, 4th paragraph

The SAP states that "The results of the analysis of the soil samples will dictate the disposal method of the remaining soil cuttings." The question of where the soil cuttings will be stored prior to receipt of the laboratory results needs to be addressed. It is recommended that the cuttings be stored in sealed, labelled drums during this period.

Section 4.1.3, p. 4-3, 1st paragraph

The proposed use of bentonite flakes and borehole cuttings to plug and abandon boreholes is not recommended. The bentonite may not swell properly to seal the borehole, given the dry materials present at the site. PRC recommends that boreholes be plugged and abandoned using cement-bentonite grout placed by tremie pipe, from the bottom of the borehole to the top.

Section 4.3.1, p. 4-4, 6th paragraph

Steel or concrete barriers should be used for construction of traffic barriers to protect the monitoring wells[6], not schedule 80 PVC pipe.

Section 4.9.2, p. 4-13

QC samples will include both "field blanks" and "equipment rinsate samples." These two terms are often considered to be synonymous[7]. The term "field blank" should be defined, since it apparently differs from the "equipment rinsate sample."

Section 5.2.3 p. 5-3 1st paragraph

Reference to the total chromium instrument detection limit (IDL) of 0.5 mg/kg and the chromium reporting limit of 1 mg/kg, which is twice the (IDL) should be cited. According to EPA CLP protocol[8], the contract required detection limit (CRDL) for chromium is 10 µg/L for water samples, which is converted to a CRDL of 1 mg/kg for soil samples reported on the basis of dry weight, with 1 gram of soil sample digested and diluted to 100 mL of final volume (equation on page D-8 of the CLP SOW). Generally, it is acceptable for the laboratory to obtain an IDL lower than the CRDL. Although the term "reporting limit" mentioned in Section 5.0 is not referenced in the CLP SOW, a reporting limit of 1 mg/kg, which is equivalent to the CRDL for total chromium, is acceptable.

Section 5.3 p. 5-3 3rd paragraph

It should be clearly indicated which matrix-specific QC methods apply to this project. In general, only matrix spikes and matrix duplicates are performed for inorganics analysis. For organics, matrix spikes and matrix spike duplicates are the required QC procedures.

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[6] U.S. EPA, 1986, RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, OSWER-9950.1, page 86.

[7] U.S. EPA, 1987, Data Quality Objectives for Remedial Response Activities, EPA/540/G-87/003, March 1987, Section C.6.5, page C-11.

[8] U.S. EPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganics Analysis (Revision 4/89).

Section 5.3.1.1 p. 5-4 2nd paragraph

Although the method of determining the control limits for the laboratory control samples based on the historical mean recovery plus or minus three standard deviation units is presented by EPA[9], control limits of 80-120% are specified by CLP procedures for all metals except Ag and Sb (EPA[8], page E-19). This range should be also observed for the chromium laboratory control sample (LCS) analysis.

Section 5.3.1.3 p. 5-6, 3rd paragraph

Reference to the information presented in this paragraph should be cited for verification. The CLP SOW[8] (page E-13) mentions the use of the CRDL as the action level for determining the needed re-analysis of samples associated with contaminated blanks, not two times the reporting limit as mentioned in the first sentence of this paragraph. It should also be noted that chromium contamination is not expected to be a problem for the method blanks; therefore, when a blank is unacceptable, corrective action should be taken to obtain an acceptable blank. All affected samples should be re-analyzed per the CLP protocol.

Section 5.3.2.1 p. 5-7, 3rd paragraph

The definitions of the matrix spike ("a MS is an environmental sample to which known concentrations of analytes have been added") and matrix spike duplicate ("a MSD is an environmental sample that is divided into separate aliquots, each of which is spiked with known concentrations of analytes") are confusing. In fact, MS and MSD are two split aliquots from the same environmental sample, each of which is equally spiked with known concentrations of analytes.

Please call me at (505) 889-9777 if you have any questions regarding this review.

Sincerely,

Jeffrey Forbes
Project Manager

cc: Cameron Clarke PRC-EMI
David Liu PRC-EMI

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[9] U.S. EPA, 1990, Test Methods for Evaluating Solid Waste, SW-846 (Revision 11/90), p. ONE-17.

PRC Environmental Management, Inc.

Work Product Review Checklis* QA/QC Level Q

Project/Contract No. 112-K-9030		Client/Contract EPA Reg. 9	
Type * D L P R O	Title: Tech. Review of SAP, Navajo Gen. Stn.	Draft or Final:	No. of Pages: 5
Checklist/ Initiated By: J. Forbes	Rec'd by EMI / /	Review Deadline / /	Delivery Due Date 4/15/91
WA Mgr./Tech. Monitor Project Manager: Jeffrey Forbes		Date Drafted 4-12-91	Author of Work Product: Jeffrey Forbes
Editorial Reviewer (ER): DEBRA LOPEZ		Date Reviewed: 04/15/91	Signature:
Technical Reviewer (TR): JAY T. SNYDER		Date Reviewed: 04/14/91	Signature: Jay T Snyder
QC Coordinator (QCC): BOB CRICH		Date Reviewed: 4/15/91	Signature:

	ACCEPTABLE									CORRECTIVE ACTION NEEDED						NOT APPLICABLE			COMMENTS
	5			4			3			2			1						
	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	ER	TR	QCC	
Introduction			X	X	X														
Site/Project Background			X	X	X														
Validity of Data																X	X	X	
Unusual Site Conditions Studied																X	X	X	
Pertinent Discussion					X											X			
Supported Summary/Conclusions																X	X	X	
Justifiable Recommendations		X	X					X	-							X			
Tables & Figures Cited																	X	X	
Complete Reference List				X	X	X													
Appendices Attached																X	X	X	
Clear & Readable Text				X	X	X													
Overall Organization				X	X	X													
Technical Adequacy/Accuracy		X	X													X			
Tech. Complete., All Altern. Considered						X		X								X			See below
Scope of Work Plan Objectives Covered			X		X											X			
Supporting Materials Used in Tech Review?					Y											X			TR: Please mark Y or N in column

* Work product types: D for database, L for letter, P, for plan, R for report, O for other type. Circle one.
Use commentary sheet for detailed comments.
List necessary corrective actions and continue on reverse side, if needed.

Sampling strategy needs discussion. Let's discuss. JTS

Jeff was great

Corrective Action Completed or Not Required: _____ QCC Signature Date 4/15/91

Distribution: 1) Original and commentary sheets, if any, plus last draft to project file 2) Copy + hard copy of final version to QA/QC file
3) Copy to Tech Reviewer 4) Copy to QCC

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ICF TECHNOLOGY INCORPORATED

MEMORANDUM

TO: Peggy Garties (H-2-2)
EPA Project Coordinator

THROUGH: Kent Kitchingman, Chief (P-3-2)
Quality Assurance Management Section

FROM: Gerald P. Manuell GPM
ESAT Investigation Coordinator

DATE: April 3, 1991

SUBJECT: Navajo Generating Station Field Sampling Plan

The Field Sampling Plan (FSP) for the Navajo Generating Station in Page, Arizona has been reviewed. Most of the comments from the October 8, 1990 ESAT memorandum have been addressed. Those comments that were not, and the following comments, should be addressed before actual work commences. A copy of the previous ICF memorandum has been included for your reference.

1. [Section 3.1, p. 3-1] It is stated in Section 3.1 that groundwater samples are to be sampled for analysis of hexavalent chromium. However, the FSP objectives state that groundwater samples are only to be sampled for analysis of total chromium using EPA Method 6010. This discrepancy should be clarified. Hexavalent chromium may be analyzed by EPA Method 218.4.

2. [Section 3.3.1, Section 3.3.1.1 through Section 3.3.1.6, and Table 3-1] A discrepancy exists between Table 3-1 and the narrative. The table lists 18 duplicate samples, Section 3.3.1 lists 17 duplicates, and the narrative subsections propose 16 duplicate samples for collection. This discrepancy should be clarified.

   [Figure 24] Only 46 sample locations are indicated on the map, but the narrative subsections state that 47 locations are to be sampled. This discrepancy should be clarified.

3. [Section 3.3.2, p. 3-14] It is suggested that approximate well depths and screening intervals be given for the proposed wells.

4. [Section 3.3.2.3 and 3.3.1.4, p. 3-14] Refer to comment 4 of the October 8, 1990 ICF memorandum regarding the rationale for deciding the total number of soil samples proposed in the soil accumulation area and

the east coal pile terrace. This comment still needs to be addressed.

5. [Section 3.4, p. 3-14] A tabular request for analyses is suggested. This may include sample matrix, analytical methods, analytical holding times, contract holding times, sample preservation method, sample container, total number of containers, sample identification number, and sampling schedule.

6. [Section 4.1.3, p. 4-3] Mixing the borehole cuttings with bentonite flakes during borehole abandonment, is not recommended. A possibility exists where potentially contaminated soil may be mixed with the bentonite and cause contamination in a previously clean area. The EPA, September 1986, RCRA Groundwater Technical Enforcement Guidance Document, Section 3.2.2, p. 86, suggests sealing the borehole with a cement and bentonite mixture. The addition of bentonite to the cement admixture should be in the amount of 2-5% by weight of cement content. This will aid in reducing shrinkage and control time of setting.

7. [Section 4.3.1, p. 4-4] The rationale for choosing well screen slot size and appropriate gradation of (filter pack) sand should be stated. The decision should be based on historical data or sieve analysis.

8. [Section 4.3.2, p. 4-4] The procedures for measuring well water stability parameters are required, with the corresponding rationale for determination of stability. Stability is determined when a specific parameter deviates not more than 10% over three consecutive measurements. Stability parameters are to be measured at a minimum frequency of one set of measurements per calculated well volume.

9. [Section 4.9.2, p.4-13] EPA recommends collecting only one type of QC blank sample per day. If equipment decontamination is to be conducted that day, equipment blank samples are preferred over water blank samples.

Questions or comments may be referred to me at (415) 882-3068. The document will be retained in the ESAT files until further requested.

cc.: Tom Huetteman, EPA QAMS (P-3-2)

Attachment

file copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

24 OCT 1990

Dennis Shirley
Water Quality/Waste Management Division
Salt River Project
P.O. Box 52025
Phoenix, AZ 85072-2025

Dear Dennis:

Enclosed are EPA's comments on the Draft Part A of the Sampling and Analysis Plan dated September 12, 1990 submitted by Salt River Project. Some of the comments may concern items which you had planned to include in Part B of the Plan. An additional comment from all reviewers was that a true evaluation should include a review of the entire Plan.

However, we have tried to evaluate the overall scope of the plan as you requested. As you will see from the comments, the general scope of the Plan is acceptable, with the exception of some major questions on the groundwater monitoring and depth of soil sampling.

Our main concern is that the results of the sampling and analysis must accurately detect either the presence or absence of contamination. To this end, more work needs to be done to show that sampling will be done in areas where contaminants could be expected to have migrated.

If you have any questions, I can now be reached at (415) 744-2029. Please note also our new mailing address. I understand that Thelma Estrada and Debbie Jamieson will be discussing the CA/FO when you have reviewed these comments.

Sincerely,

Peggy Garties

Peggy Garties
Compliance Officer

encl.

cc: Debbie Jamieson, SRP
Thelma Estrada, EPA
Matt Hagemann, EPA

Comments on the Draft Part A Sampling and Analysis Plan for Determining Potential Chromium Contamination at the Navajo Generating Station - September 12, 1990

Section 1

- The Objective section should include a statement of the general analytical data needed and how that data will be used.

Section 2

- 2.1.4 should include more specific construction details for the monitoring wells, i.e. slot size, filter pack size, schedule type PVC, thickness of bentonite seal, etc. Results from any recent previous sampling should be added if available.

- Gravel is usually not considered suitable as backfill material in monitoring wells. Justify its use in this situation.

- 2.1.4, page 11: The construction details regarding the three deep (1200 to 1500 foot) monitoring wells are not clear. The screened intervals should be stated. Additional information should be given on these wells including a well completion diagram and specifications, screened intervals, and some mention of where groundwater was encountered. Information regarding recent water level data should be included.

- Figure 7: Cooling tower locations do not match those in Figures 18 and 3. Indicate which maps are correct.

- Figure 8: Indicate which of these are "piezometers" and which are "water sampling wells".

- A more complete history of contamination should be presented in 2.3, including details such as the amount of waste released, estimated time in contact with various areas, and an attempt to trace the path of contamination.

Section 3

- A map clearly showing the areas where contaminants were released and subsequently transported should be included. These areas could be highlighted on an existing map showing sampling areas.

- The rationale for sampling locations should be more complete. Specifically, the mobility of chromium and its predicted behavior in soil types at the site and in groundwater should be discussed. These considerations should be used in the rationale for sampling points, particularly with respect to depth of sampling. No rationale is given for the groundwater sampling points.

- 3.1.1.1: The assumption that no contamination from the old S-13 impoundment could have migrated greater than 10 feet in depth should be justified, or additional sampling points under the current impoundment should be proposed.

- 3.1.1.2: It may not be correct to assume that all potential soil contamination between WDCB #3 and NDCB #9 along the west plant drainage area was indeed excavated. This area should be sampled for confirmation.

- The integrity of the concrete drainage piping should also be considered; if the piping had cracks or leaks in the joints, seepage could have occurred along the steep grade of the drainage.

- Based on the historical fact that the ditch was unlined, sampling should be done to depths reasonably below the drainage ditch grades. These grades have been mentioned to vary from 5-8 feet deep along the north-south ditch, to 8-20 feet deep along the east-west adjoining pipeline (see page 28 of the plan). The "surface soil sampling" depths have not been specified, and it would be prudent to sample at shallow subsurface levels, as suggested.

  It is also not specified which geologic materials the drainages are graded and completed in. If completed in dune sand (which is likely by viewing the Carmel Formation Isopach Map, figure 6 of the Plan), then it is likely that contaminants may have infiltrated in the vertical direction, rapidly, as stated on page 15, Section 2.2.3.1. In this case, sampling should be done at greater depths.

- 3.1.1.3: The plan states that it is considered unlikely to have had any appreciable seepage along the overflow drainages from S-13. This assumption should be justified, or samples should be taken at depth.

- Samples in the S-14 have been proposed "at regular intervals below the surface". The plan should include depths or approximate depths and rationale.

- Soil Sampling Areas: In areas B, C, and perhaps D, a greater number of samples should be collected to account for the large volumes of soil potentially in question.

- Composite samples should be collected to account for the variability in depths where composition is an unknown, such as in the ash deposits. At a minimum, a range of sampling depths should be suggested.

- By sampling only 8 small soil samples in 10,000 cubic yards of material at soil accumulation area (Area C), a confidence level of much less than 0.1% would be achieved. This is not a sufficient amount of soil to be randomly sampled for such a large volume of material. These samples would not be considered representative of the population.

- Additionally, 20 small soil samples to be collected in 40,000 cubic yards of material at the east coal pile terrace is considered an insufficient amount to represent conditions anything above 0.05% confidence.

- It is unclear what the alternate sample points represent in Figures 20 and 21, and when these points might be sampled.

- 3.1.2: Rationale for the groundwater sampling points needs to be more complete. The plan should more clearly show the gradient(s) in the perched aquifer in order to justify that sampling points will accurately characterize any contamination resulting from the BCW.

- A groundwater contour map should be included.

- A background well should be identified.

- Downgradient wells should be identified which can be shown to monitor areas most likely to be contaminated.

- It has been mentioned that certain monitoring wells would be deleted from the sampling event, but those eliminated are located in important areas of the site. Wells #30, 32, 33 56 and 69 should probably be sampled upon sufficient recovery of groundwater (80%).

  For example, Well 30 is situated downgradient of the newly buried pipeline which leads to Pond S-13. Well 69 is located just east of the west plant drainage ditch, where seepage may have occurred. Well 56 is located downgradient, along the fenceline of the plant perimeter. These wells are shown on Figure 8, but have been deleted on Figure 18 which shows the wells to be sampled. Data concerning groundwater levels and well specifications have also been eliminated for these wells.

- Sampling methods for groundwater should be included, including sampling devices, method of analysis, QA/QC, etc. Guidance for groundwater sampling is found in the revised Chapter 11 to SW-846 (enclosed).

General

- The analytical methods to be used, parameters to be analyzed for, desired detection limits, sample containers and holding times need to be clearly stated. Table form is recommended.

- For areas where random sampling is to be done, indicate what method will be used to select the random sample points.

- It is recommended that duplicate samples be taken in areas of greatest known or suspected contamination. Locations of duplicate samples should be identified.

- The depth at which samples will be taken needs to reflect the highly mobile nature of hexavalent chromium in soil, and should be discussed.

160 Spear Street, Suite 1380
San Francisco, California
94105-1535

415/957-0110

ICF TECHNOLOGY INCORPORATED

MEMORANDUM

TO: Peggy Garties
Arizona, Nevada, and Pacific Islands Section

THROUGH: for Kent Kitchingman, Chief (P-3-2) K. Mann
Quality Assurance Management Section

FROM: Susan M. Sanders
ESAT Investigation Coordinator

DATE: October 8, 1990 SMS

SUBJECT: Review of the NAVAJO GENERATING STATION Sample and Analysis Plan

The Sample and Analysis Plan (SAP) for the Navajo Generating Station in Arizona has been reviewed. The following comments pertain to the plan, and should be addressed before the actual work commences.

1. Section 2.1.4, page 11: The construction details regarding the three deep (1200 to 1500 foot) monitoring wells are not clear. The screened intervals should be stated. Additional information should be given on these wells including a well completion diagram and specifications, screened intervals, and some mention of where groundwater was encountered. It would also be informative to include information regarding recent water level data.

2. Section 3.1.1.2, page 30: It may not be a safe assumption to assume that all the soil between WDCB #3 and NDCB #9 along the west plant drainage area was indeed removed and replaced. This area should probably be sampled for confirmation.

3. Page 32: The integrity of the concrete drainage piping should be considered, in case it was less than adequate. It should be considered, if the piping might have had cracks or leaks in the joints, that seepage could have occurred along the steep grade of the drainages.

   As such, and based on the historical fact that the ditch was unlined, sampling should be done to depths reasonably below the drainage ditch grades. These grades have been mentioned to vary from 5-8 feet deep along the north-south ditch, to 8-20 feet deep along the east-west adjoining pipeline (see page 28 of this plan). The "surface soil sampling" depths

have not been specified, and it would be prudent to sample at shallow subsurface levels, as suggested.

It is also not specified which geologic materials the drainages are graded and completed in. If completed in dune sand (which is likely by viewing the Carmel Formation Isopach Map, Figure 6 of this plan), then it is likely that contaminants may have infiltrated in the vertical direction, rapidly, as stated on page 15, Section 2.2.3.1.

4. In areas B, C, and perhaps D, it is suggested that a greater number of samples be collected to account for the large volumes of soil potentially in question.

   It is suggested that composite samples be collected to account for the variability in depths where composition is an unknown, such as in the ash deposits. At a minimum, a range of sampling depths should be suggested.

   By sampling only 8 small soil samples in 10,000 cubic yards of soil at the soil accumulation area (Area C), a confidence level of much less than 0.1% would be achieved. This is not a sufficient amount of soil to be randomly sampled for such a large volume of material. These samples would not be considered representative of the population.

   Additionally, 20 small soil samples to be collected in 40,000 cubic yards of material at the east coal pile terrace is considered an insufficient amount to represent conditions anything above 0.05% confidence.

   It is unclear what the alternate sample points represent in Figures 20 and 21, and when it might be that these points might be sampled.

5. Although it has been mentioned that certain monitoring wells would be deleted from the sampling event, those eliminated are located in important areas of the site. Wells #30, 32, 33, 56 and 69 should probably be sampled upon sufficient recovery of groundwater (80%).

   For example, Well 30 is situated downgradient of the newly buried pipeline which leads to Pond S-13. Well 69 is located just east of the west plant drainage ditch, where seepage may have occurred. Well 56 is loated downgradinet, along the fenceline of the plant perimeter. These wells are shown on Figure 8, but have been deleted on Figure 18 which shows the wells to be sampled. Data concerning groundwater levels and well specifications have also been eliminated for these wells.

6. Describe the analysis to be used for hexavalent chromium.

7. The analytical method(s) to be used, parameters to be analyzed for, desired detection limits, sample containers and holding times need to be clearly stated. Also, the depth at which samples will be taken needs to reflect the highly mobile nature of hexavalent chromium in soil, and should be discussed.

Questions regarding these comments may be directed to me at 882-3031.

cc: Laurie Mann, EPA QAMS

March 19, 1990

CERTIFIED MAIL NO.
RETURN RECEIPT REQUESTED

In Reply Refer to: H-2-2
AZD0744552426

Mr. John R. Lassen, President
Salt River Project
1521 Project Drive
Phoenix, AZ 85072

Box 52025
Phoenix, AZ 85072

Re: Request for information on Navajo Generating Station

Dear Mr. Lassen:

On November 22, 1989 the Environmental Protection Agency (EPA) issued a complaint concerning violations of the Resource Conservation and Recovery Act to Salt River Project's Navajo Generating Station. On January 12, 1990 representatives of Salt River Project (SRP), including SRP Attorney Deborah Jamieson met with representatives of EPA at the San Francisco regional office to discuss the complaint. At that meeting, SRP informed EPA that bearing cooling water containing chromium, which is the subject of the complaint, is currently being treated in a mobile treatment unit at the site. During the meeting, EPA requested more information about this treatment process.

EPA has not yet received any information on the treatment process. Pursuant to Section 3007(a) of the Resource Conservation and Recovery Act (RCRA) and Section 104(e) of the Comprehensive Environmental Response, Compensation and Liability Act, we request that you provide the following information:

1. The company name, address and U.S. EPA ID number of the mobile treatment unit employed to treat the bearing cooling water (BCW) drained from the BCW system at Navajo Generating Station;

2. A full written description of the treatment process being used to treat the water;

3. Results of all chemical analyses of the BCW, including chromium levels in the water before and after treatment;

4. A written description or diagram showing the flow of water drained from the BCW system, to the mobile treatment unit, to the surface impoundments or other placement at the facility.

5. Receipts, reports or other documentation showing the volume of water treated in the mobile treatment unit;

6. The cost of the treatment process; cost figures shall include both total cost and cost per gallon or other unit, and any other breakdown of costs, as charged by the mobile treatment unit and paid by your company;

7. The current status of the BCW system and the treatment process, including volume of water already treated and volume of water remaining in the BCW system.

Under Section 3008 of RCRA [42 U.S.C. Section 6928], failure to provide the information requested in this letter may result in an order requiring compliance or a civil action for appropriate relief. Section 3008 also provides for criminal penalties for knowingly making a false statement.

EPA regulations governing confidentiality of business information are set forth in Part 2, Subpart B of Title 40 of the Code of Federal Regulations. For any portion of the information submitted which is entitled to confidential treatment, please assert a confidentiality claim in accordance with 40 C.F.R. 2.203(b). If EPA determines that the information so designated meets the criteria set forth in 40 C.F.R. 2.208, the information will be disclosed only to the extent, and by means of the procedures specified in 40 C.F.R. Part 2, Subpart B. EPA will construe the failure to furnish a confidentiality claim with your response to this letter as a waiver of the claim, and information may be made available to the public by EPA without further notice.

Your response to this request must be by letter signed by you or a duly authorized official, and addressed to Peggy Garties, H-2-2, State Programs Branch, U.S. EPA Region 9, 1235 Mission St., San Francisco, CA 94103. A copy of your response should be sent to Thelma Estrada, Assistant Regional Counsel, U.S. EPA Region 9, 1235 Mission St., San Francisco, CA 94103. Your response must be received by EPA within fifteen (15) days of your receipt of this letter.

If you have any questions about this matter, please contact Peggy Garties at (415)744-1166, or Thelma Estrada at (415)556-5886.

Your cooperation in this matter is appreciated.

Sincerely,

Jeffrey Zelikson
Director, Hazardous
Waste Management Division

cc: Debbie Jamieson, Salt River Project
Al Brown, Arizona Department of Environmental Quality
Acting Director, Navajo Environmental Protection Agency

bc: Thelma Estrada, ORC
Bill Weis, H-4-3
Rocceena Lawatch, E-3

SYMBOL	H-2-2	H-2-3	H-2	H-1-W	H-1	
SURNAME	Garties	Brown	RV		JZ	
DATE	3/8/90	3/9/90	3/9/90	3-12-90	3/12/90	

U.S. EPA CONCURRENCES OFFICIAL FILE COPY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9
1235 MISSION STREET
SAN FRANCISCO, CA 94103

VIA FACSIMILE/Regular Mail

July 19, 1990

Susan Sawtelle, Esq.
Piper & Marbury
1200 Nineteenth Street, N.W.
Washington, D.C. 20036

Re: Salt River Project: Navajo Generating Station
Docket No. RCRA-09-90-0001

Dear Ms. Sawtelle:

I transmit herewith a draft Consent Agreement and Final Order in the above-referenced matter which Thelma Estrada prepared and asked that I send to you. Ms. Estrada will return to our office on July 30, 1990.

Very truly yours,

Martin H. Pesaresi
Assistant Regional Counsel

cc: Thelma Estrada (w/enclosure)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105-3901

February 10, 1991

Roger Clark
Director of Research
Grand Canyon Trust
Route 4, P.O. Box 718
Flagstaff, AZ 86001

RE: Freedom of Information Act Request RIN-9-0218-92

Dear Mr. Clark:

Your Freedom of Information Act request did not contain sufficient information to enable the Agency to make a determination on your fee waiver request.

The Freedom of Information Reform Act of 1986 provides that "Documents shall be furnished without any charge or at a charge reduced below the fees established under clause (ii) if disclosure of the information is in the public interest because it is likely to contribute significantly to public understanding of the operations or activities of the government and is not primarily in the commercial interest of the requestor." In order to evaluate whether the statutory standard authorizing a fee waiver or reduction has been met, we will need additional information upon which to base our determination. Your response should include:

(i) A clear statement of your interest in the requested documents, the use proposed for the documents and whether you will derive income or other benefit from such use;

(ii) A statement of how the public will benefit from such use and from the release of the requested documents;

(iii) If specialized use of the documents or information is contemplated, a statement of your qualifications that are relevant to the specialized use;

(iv) A statement indicating how you plan to disseminate the documents or information to the public; and

(v) Any additional information you deem relevant to your request for a fee wavier.

If we have not heard from you by March 4, 1991 we will issue a determination based upon the information provided in your letter. If you have any questions, please call me at (415) 744-1586.

Sincerely,

Sharon A. Jang
Freedom of Information Assistant

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

January 16, 1991

Deborah A. Jamieson
Salt River Project
P.O. Box 52025
Phoenix, Arizona
85702-2025

Re: Consent Agreement and Final Order,
Navajo Generating Station RCRA Docket #09-90-0001

Dear Debbie:

Enclosed is the final CA/FO which was signed by the Regional Judicial Officer and filed with the Regional Hearing Clerk on January 4, 1991. Unfortunately, due to a miscommunication in our office, your signed and executed copy was not sent to you shortly thereafter. Please accept our apologies for the delay in sending this to you.

As required by the CA/FO, EPA is designating a Project Coordinator to oversee the implementation of the CA/FO. The EPA Project Coordinator is Peggy Garties. Within fourteen days of receipt of the CA/FO, please advise us the designated Project Coordinator for Salt River Project.

Like you, I am pleased that the agreement has been finalized and look forward to its smooth implementation.

Sincerely,

Thelma K. Estrada
Assistant Regional Counsel

CERTIFICATE OF SERVICE

I hereby certify that on January 4, 1991, one original of the foregoing Consent Agreement and Final Order was filed with the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region IX, 75 Hawthorne St., San Francisco, CA 94105; that on January 16, 1991, another original of the same was sent by Federal Express to Deborah Jamieson, Esq., Salt River Project, P.O. Box 52025, Phoenix, Arizona, 85705.

Thelma K. Estrada

SALT RIVER PROJECT

POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

WQ&WM-9291

Overnight Mail

April 4, 1991

Ms. Peggy Garties
Project Coordinator
U.S. Environmental Protection Agency
Region IX (H-2-2)
75 Hawthorne Street
San Francisco, CA 94105

RE: Navajo Generating Station RCRA Docket #09-90-0001 - Consent Agreement and Final Order (CA/FO)

Dear Ms. Garties:

Pursuant to the requirement of the CA/FO, enclosed is the quarterly report for the Salt River Projects's (SRP) Navajo Generating Station. The quarterly report consists of the monthly hazardous waste activities for the months of January, February, and March of 1991 as well as a summary of the waste shipped off-site for this period.

The report identifies the amount and types of hazardous waste generated, the dates accumulation began, the name of the TSD to which the waste was shipped, the dates the waste was shipped, and copies of accompanying manifests (manifest document numbers 91N01, 91N02, 91N03, and 91N05; manifest 91N04 was a PCB shipment and is not included in this report).

If there are any questions regarding this report, please contact me at (602) 236-2811.

Sincerely,

Daniel J. Casiraro

Daniel J. Casiraro
Principal Staff Engineer
Environmental Management Services

DJC:dg
Enclosures

cc: Jeffrey Zelikson, U.S. EPA
Louise Lincoln, Navajo EPA

File: LOC-5-4/HZW-1-4

JANUARY HAZARDOUS WASTE ACTIVITIES

SUMMARY OF HAZARDOUS WASTE
ACCUMULATION, DISPOSAL, AND RECYCLING
DURING THE MONTH OF JAN , 1991

FACILITY: NAVAJO GENERATING STATION

EPA ID NO. AZD074452426

		On Site Accumulation			Disposal/Recycle								
Container ID No.	Container Contents (* acutely hazardous)	Accum Start Date	Drum Gross Weight	Units	Date Rec'd @ Central Accum.	Shipping Due Date	Manifest Shipping Date	Manifest Number	Manifest Quantity	Units	Total Days Accum	Drum Volume	Drum Material
NGS-89035	SOLVENT	12/31/90			12/31/90	3/30/91	1/ 9/91	00091002	303	LBS	9	55	STEEL
NGS-90038	MERCURY WASTE	10/12/90			10/12/90	1/ 9/91	1/ 9/91	00091001	83	LBS	89	12	STEEL
NGS-90051	SOLVENT		110	LBS								55	STEEL
NGS-90073	MERCURY	11/30/90			11/30/90	2/27/91	1/ 9/91	00091001	48	LBS	40	16	STEEL
NGS-90083	WASTEOIL/SOLVENT	11/ 9/90	462	LBS	11/ 9/90	2/ 6/91						55	STEEL
NGS-90084	WASTEOIL/SOLVENT	11/ 9/90	325	LBS	11/ 9/90	2/ 6/91						55	STEEL
NGS-90085	SOLVENTS		220	LBS								55	STEEL
NGS-90086	SOLVENTS	11/ 9/90			11/ 9/90	2/ 6/91	1/ 9/91	00091002	305	LBS	61	55	STEEL
NGS-90081	PAINT WASTE	12/26/90			12/26/90	3/25/91	1/ 9/91	00091002	433	LBS	14	55	STEEL
NGS-90092	PAINT WASTE		330	LBS								55	STEEL
NGS-90088	SOLVENTS		110	LBS								55	STEEL
NGS-90087	SOLVENTS		110	LBS								55	STEEL
NGS-91002	SOLVENTS	10/27/90			10/27/90	1/24/91	1/ 9/91	00091002	250	LBS	74	55	STEEL
NGS-91003	SOLVENTS	10/27/90			10/27/90	1/24/91	1/ 9/91	00091002	462	LBS	74	55	STEEL
NGS-91004	SOLVENTS	10/15/90			10/15/90	1/12/91	1/ 9/91	00091002	355	LBS	86	55	STEEL
NGS-91005	SOLVENTS	10/29/90			10/29/90	1/26/91	1/ 9/91	00091002	283	LBS	72	55	STEEL
NGS-91006	SOLVENTS	10/29/90			10/29/90	1/26/91	1/ 9/91	00091002	195	LBS	72	55	STEEL
NGS-91007	SOLVENTS	11/13/90			11/13/90	2/10/91	1/ 9/91	00091002	442	LBS	57	55	STEEL
NGS-91008	SOLVENTS	11/13/90			11/13/90	2/10/91	1/ 9/91	00091002	339	LBS	57	55	STEEL
NGS-91009	LUBE OIL AND SOL	11/ 2/90			11/ 2/90	1/30/91	1/ 9/91	00091002	126	LBS	68	55	STEEL
NGS-91010	SOLVENTS	11/12/90			11/12/90	2/ 9/91	1/ 9/91	00091002	447	LBS	58	55	STEEL
NGS-91013	SOLVENTS	1/14/91	378	LBS	1/14/91	4/13/91						55	STEEL
NGS-91018	CONTAMINATED LIQ	12/20/90	427	LBS	12/20/90	3/19/91						55	STEEL
NGS-91019	CONTAMINATED LIQ	12/20/90	449	LBS	12/20/90	3/19/91						55	STEEL
NGS-91020	CONTAMINATED LIQ	12/20/90	508	LBS	12/20/90	3/19/91						55	STEEL
NGS-91021	CONTAMINATED LIQ	12/20/90	416	LBS	12/20/90	3/19/91						55	STEEL
NGS-91022	CONTAMINATED LIQ	12/20/90	216	LBS	12/20/90	3/19/91						55	STEEL
NGS-91023	SLUDGE	12/20/90	107	LBS	12/20/90	3/19/91						20	POLY
NGS-91024	SLUDGE	12/20/90	153	LBS	12/20/90	3/19/91						20	POLY
NGS-91025	SLUDGE	12/20/90	168	LBS	12/20/90	3/19/91						20	POLY

SUMMARY OF HAZARDOUS WASTE
ACCUMULATION, DISPOSAL, AND RECYCLING
DURING THE MONTH OF JAN , 1991

FACILITY: NAVAJO GENERATING STATION

EPA ID NO. AZD074452426

		On Site Accumulation			Disposal/Recycle							
Container ID No.	Container Contents (* acutely hazardous)	Accum Start Date	Drum Gross Weight	Units	Date Rec'd @ Central Accum.	Shipping Due Date	Manifest Shipping Date	Manifest Number	Manifest Quantity	Units	Total Days Accum	Drum Volume	Drum Material
GS-91026	SLUDGE	12/20/90	166	LBS	12/20/90	3/19/91						20	POLY
GS-91027	SLUDGE	12/20/90	121	LBS	12/20/90	3/19/91						20	POLY
GS-91028	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
GS-91029	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
GS-91030	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
GS-91031	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL

TOTAL ON SITE ACCUMULATION = 5008 LBS TOTAL SHIPPED = 4071 LBS

GENERATING STATUS

MANIFEST QUANTITY THIS MONTH	+	ON-SITE ACCUMULATION THIS MONTH	-	ON-SITE ACCUMULATION LAST MONTH	=	FACILITY GENERATION AMOUNT
4071 LBS	+	5008 LBS	-	2213 LBS	=	6866 LBS

Navajo Generating Station was a large quantity generator during this month.

PREPARED BY: Gordon Davis (print) Gordon Davis (signature) PR# 63582 DATE: Feb 5, 1991

APPROVED BY: Bob Candelaria (print) Robert B. Candelaria (signature) PR# 60667 DATE: 2/6/91

C:\HAZARD\ADR.RPT

FEBRUARY HAZARDOUS WASTE ACTIVITIES

SUMMARY OF HAZARDOUS WASTE ACCUMULATION, DISPOSAL, AND RECYCLING DURING THE MONTH OF FEB , 1991

FACILITY: NAVAJO GENERATING STATION

EPA ID NO. AZD074452426

		On Site Accumulation			Disposal/Recycle								
Container ID No.	Container Contents (* acutely hazardous)	Accum Start Date	Drum Gross Weight	Units	Date Rec'd @ Central Accum.	Shipping Due Date	Manifest Shipping Date	Manifest Number	Manifest Quantity	Units	Total Days Accum	Drum Volume	Drum Material
NGS-90051	SOLVENT		220	LBS								55	STEEL
NGS-90083	WASTEOIL/SOLVENT	11/ 9/90			11/ 9/90	2/ 6/91	2/ 1/91	00091003	462	LBS	84	55	STEEL
NGS-90084	WASTEOIL/SOLVENT	11/ 9/90			11/ 9/90	2/ 6/91	2/ 1/91	00091003	325	LBS	84	55	STEEL
NGS-90085	SOLVENTS	2/11/91	510	LBS	2/11/91	5/11/91						55	STEEL
NGS-90092	PAINT WASTE	2/ 4/91	476	LBS	2/ 4/91	5/ 4/91						55	STEEL
NGS-90088	SOLVENTS	Satellite	330	LBS	N/A	N/A						55	STEEL
NGS-90087	SOLVENTS	Satellite	220	LBS	N/A	N/A						55	STEEL
NGS-91001	SOLVENTS	Satellite	110	LBS	N/A	N/A						55	STEEL
NGS-91013	SOLVENTS	1/14/91	378	LBS	1/14/91	4/13/91						55	STEEL
NGS-91018	CONTAMINATED LIQ	12/20/90	427	LBS	12/20/90	3/19/91						55	STEEL
NGS-91019	CONTAMINATED LIQ	12/20/90	449	LBS	12/20/90	3/19/91						55	STEEL
NGS-91020	CONTAMINATED LIQ	12/20/90	508	LBS	12/20/90	3/19/91						55	STEEL
NGS-91021	CONTAMINATED LIQ	12/20/90	416	LBS	12/20/90	3/19/91						55	STEEL
NGS-91022	CONTAMINATED LIQ	12/20/90	216	LBS	12/20/90	3/19/91						55	STEEL
NGS-91023	SLUDGE	12/20/90	107	LBS	12/20/90	3/19/91						20	POLY
NGS-91024	SLUDGE	12/20/90	153	LBS	12/20/90	3/19/91						20	POLY
NGS-91025	SLUDGE	12/20/90	168	LBS	12/20/90	3/19/91						20	P
NGS-91026	SLUDGE	12/20/90	166	LBS	12/20/90	3/19/91						20	POLY
NGS-91027	SLUDGE	12/20/90	121	LBS	12/20/90	3/19/91						20	POLY
NGS-91028	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
NGS-91029	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
NGS-91030	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
NGS-91031	COATINGS	1/ 2/91	58	LBS	1/ 2/91	4/ 1/91						5	STEEL
NGS-91016	PAINT	2/20/91	475	LBS	2/20/91	5/20/91						55	STEEL
NGS-91014	SOLVENTS	Satellite	110	LBS	N/A	N/A						55	STEEL
NGS-91017	SOLVENTS	Satellite	110	LBS	N/A	N/A						55	STEEL
NGS-91032	SOLVENTS	2/ 4/91	415	LBS	2/ 4/91	5/ 4/91						55	STEEL
NGS-91033	SOLVENTS	2/ 4/91	450	LBS	2/ 4/91	5/ 4/91						55	STEEL
NGS-91034	SOLVENTS	2/ 4/91	320	LBS	2/ 4/91	5/ 4/91						55	STEEL
NGS-91035	PAINT WASTE	Satellite	330	LBS	N/A	N/A						55	STEEL

SUMMARY OF HAZARDOUS WASTE ACCUMULATION, DISPOSAL, AND RECYCLING DURING THE MONTH OF FEB , 1991

ACILITY: NAVAJO GENERATING STATION

EPA ID NO. AZD074452426

		On Site Accumulation			Disposal/Recycle								
ontainer ID No.	Container Contents (* acutely hazardous)	Accum Start Date	Drum Gross Weight	Units	Date Rec'd @ Central Accum.	Shipping Due Date	Manifest Shipping Date	Manifest Number	Manifest Quantity	Units	Total Days Accum	Drum Volume	Drum Material
GS-91038	SOLVENTS	2/22/91	350	LBS	2/22/91	5/22/91					55		STEEL

TOTAL ON SITE ACCUMULATION = 7767 LBS

TOTAL SHIPPED = 787 LBS

GENERATING STATUS

MANIFEST QUANTITY THIS MONTH	+	ON-SITE ACCUMULATION THIS MONTH	-	ON-SITE ACCUMULATION LAST MONTH	=	FACILITY GENERATION AMOUNT
787 LBS	+	7767 LBS	-	5008 LBS	=	3546 LBS

vajo Generating Station was a large quantity generator during this month.

PREPARED BY: Gordon Davis (print) Gordon Davis (signature) PR# 63582 DATE: march 6, 1991

APPROVED BY: Bob Candelaria (print) Robert B. Candelaria (signature) PR# 60667 DATE: 3/7/91

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MARCH HAZARDOUS WASTE ACTIVITIES

SUMMARY OF HAZARDOUS WASTE
ACCUMULATION, DISPOSAL, AND RECYCLING
DURING THE MONTH OF MAR , 1991

CILITY: NAVAJO GENERATING STATION

EPA ID NO. AZD074452426

		On Site Accumulation			Disposal/Recycle								
tainer No.	Container Contents (* acutely hazardous)	Accum Start Date	Drum Gross Weight	Units	Date Rec'd @ Central Accum.	Shipping Due Date	Manifest Shipping Date	Manifest Number	Manifest Quantity	Units	Total Days Accum	Drum Volume	Drum Material
-90051	SOLVENT	3/25/91	322	LBS	3/25/91	6/22/91						55	STE
-90085	SOLVENTS	2/11/91	510	LBS	2/11/91	5/11/91						55	STEEL
-90092	PAINT WASTE	2/ 4/91	476	LBS	2/ 4/91	5/ 4/91						55	STEEL
-90088	SOLVENTS	3/ 4/91	383	LBS	3/ 4/91	6/ 1/91						55	STEEL
-90087	SOLVENTS		220	LBS	(SATELITE	SITE)							
-91001	SOLVENTS		110	LBS	(SATELITE	SITE)							
-91013	SOLVENTS	1/14/91			1/14/91	4/13/91	3/ 8/91	00091005	378	LBS	53	55	STEEL
-91018	CONTAMINATED LIQ	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	427	LBS	78	55	STEEL
-91019	CONTAMINATED LIQ	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	449	LBS	78	55	STEEL
-91020	CONTAMINATED LIQ	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	508	LBS	78	55	STEEL
-91021	CONTAMINATED LIQ	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	416	LBS	78	55	STEEL
-91022	CONTAMINATED LIQ	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	216	LBS	78	55	STEEL
-91023	SLUDGE	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	107	LBS	78	20	POLY
-91024	SLUDGE	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	153	LBS	78	20	POLY
-91025	SLUDGE	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	168	LBS	78	20	POLY
-91026	SLUDGE	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	166	LBS	78	20	POLY
-91027	SLUDGE	12/20/90			12/20/90	3/19/91	3/ 8/91	00091005	121	LBS	78	20	POL
-91028	COATINGS	1/ 2/91			1/ 2/91	4/ 1/91	3/ 8/91	00091005	58	LBS	65	5	STE
-91029	COATINGS	1/ 2/91			1/ 2/91	4/ 1/91	3/ 8/91	00091005	58	LBS	65	5	STEEL
-91030	COATINGS	1/ 2/91			1/ 2/91	4/ 1/91	3/ 8/91	00091005	58	LBS	65	5	STEEL
-91031	COATINGS	1/ 2/91			1/ 2/91	4/ 1/91	3/ 8/91	00091005	58	LBS	65	5	STEEL
-91016	PAINT	2/20/91	475	LBS	2/20/91	5/20/91						55	STEEL
-91014	SOLVENTS	3/25/91	394	LBS	3/25/91	6/22/91						55	STEEL
-91017	SOLVENTS		330	LBS	(SATELITE	SITE)							
-91032	SOLVENTS	2/ 4/91	415	LBS	2/ 4/91	5/ 4/91						55	STEEL
-91033	SOLVENTS	2/ 4/91	450	LBS	2/ 4/91	5/ 4/91						55	STEEL
-91034	SOLVENTS	2/ 4/91	320	LBS	2/ 4/91	5/ 4/91						55	STEEL
-91035	PAINT WASTE	3/ 1/91	442	LBS	3/ 1/91	5/29/91						55	STEEL
-91036	SOLVENTS		110	LBS	(SATELITE	SITE)							
-91037	PAINT WASTE	3/18/91	438	LBS	3/18/91	6/15/91						55	STEEL

SUMMARY OF HAZARDOUS WASTE ACCUMULATION, DISPOSAL, AND RECYCLING DURING THE MONTH OF MAR , 1991

CILITY: NAVAJO GENERATING STATION

EPA ID NO. AZD074452426

		On Site Accumulation			Disposal/Recycle								
ntainer D No.	Container Contents (* acutely hazardous)	Accum Start Date	Drum Gross Weight	Units	Date Rec'd @ Central Accum.	Shipping Due Date	Manifest Shipping Date	Manifest Number	Manifest Quantity	Units	Total Days Accum	Drum Volume	Drum Material
GS-91038	SOLVENTS	2/22/91	350	LBS	2/22/91	5/22/91						55	STEEL
GS-91039	COATINGS (OVER P	0/ 0/0			0/ 0/0	0/ 0/ 0	0/ 0/0	00091005	0	LBS	0	85	STEEL
GS-91040	SOLVENTS	3/11/91	305	LBS	3/11/91	6/ 8/91						55	STEEL
GS-91041	PAINT WASTE	3/25/91	450	LBS	3/25/91	6/22/91						55	STEEL
GS-91043	PAINT WASTE		220	LBS	(SATELITE SITE)								
GS-91045	SOLVENTS	3/18/91	365	LBS	3/18/91	6/15/91						55	STEEL
GS-91046	HOUSEHOLD WASTE	3/28/91	446	LBS	3/28/91	6/25/91						55	STEEL
GS-91047	HOUSEHOLD WASTE	3/28/91	458	LBS	3/28/91	6/25/91						55	STEEL
GS-91048	SOLVENTS	3/25/91	412	LBS	3/25/91	6/22/91						55	STEEL
GS-91049	SOLVENTS	3/29/91	380	LBS	3/29/91	6/26/91						55	STEEL

TOTAL ON SITE ACCUMULATION = 8781 LBS

TOTAL SHIPPED = 3341 LBS

GENERATING STATUS

MANIFEST QUANTITY THIS MONTH	+	ON-SITE ACCUMULATION THIS MONTH	-	ON-SITE ACCUMULATION LAST MONTH	=	FACILITY GENERATION AMOUNT
3341 LBS	+	8781 LBS	-	7767 LBS	=	4355 LBS

avajo Generating Station was a large quantity generator during this month.

PREPARED BY: Gordon Davis (print) Gordon Davis (signature) PR# 63582 DATE: April 2, 1991

APPROVED BY: Bob Candelaria (print) _____ (signature) PR# 60667 DATE: _____

NOTE: Drum Nos. NGS 91-028 through 91-029 were overpacked into an 85 gal drum and shipped off as Drum No. 91-039. The discrepancy in weight with this report and manifest 91-N05 is due to the added weight of the 85 gal. steel drum.

C:\HAZARD\HAZ.WP7

JANUARY, FEBRUARY AND MARCH MANIFESTS

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFE

P.O. Box 12820, Albany, New York 12212

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039. Expires 9-30-91

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. / Manifest Document No.: AZD074524269 / NY01
2. Page 1 of 1
Information in the shaded areas is not required by Federal Law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document No. NY B 100197 0

B. Generator's ID

5. Transporter 1 (Company Name): Chemical Disposal Company, Inc.
6. US EPA ID Number: AZT050010008
C. State Transporter's ID
D. Transporter's Phone (602) 624-2348

7. Transporter 2 (Company Name): Hazmat Environmental Group
8. US EPA ID Number: NYD980769947
E. State Transporter's ID
F. Transporter's Phone (716) 827-7200

9. Designated Facility Name and Site Address
Mercury Refining Co., Inc.
26 Railroad Avenue
Albany, NY 12205
10. US EPA ID Number: NYD048148175
G. State Facility's ID
H. Facility's Phone (518) 785-1703

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, Hazardous Waste Solid, N.O.S., (Mercury Debris), ORM-E, NA 9189, (D009)	002	DM	00131	P	EPA D009 / STATE D009
b.					EPA / STATE
c.					EPA / STATE
d.					EPA / STATE

J. Additional Descriptions for Materials listed Above
16-gl steel drums
a MCS 90-038 & MCS 90-078
c
b
d

K. Handling Codes for Wastes Listed Above
a
c
b
d

15. Special Handling Instructions and Additional Information
MERECO Waste Code #SKP-5-90
Work Order No. 11934
TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name | Signature | Mo. Day Year

TRANSPORTER
17. Transporter 1 (Acknowledgement of Receipt of Materials)
Printed/Typed Name: BEN BARNETT | Signature | Mo. Day Year: 01 29 91
18. Transporter 2 (Acknowledgement of Receipt of Materials)
Printed/Typed Name | Signature | Mo. Day Year

FACILITY
19. Discrepancy Indication Space
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name | Signature | Mo. Day Year

NY B 100197 0

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Received 2/5/91

Please print or type (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. A Z D 0 7 4 4 5 2 4 2 6 — Manifest Document No. 9 1 N 0 2

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document Number: Nº 00248640

B. State Generator's ID: 99904

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.

6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID: 40158

D. Transporter's Phone: (602) 624-2348

7. Transporter 2 Company Name: Coston Environmental Transport

8. US EPA ID Number: D E D 9 8 0 9 1 8 8 5 8

E. State Transporter's ID: 40756

F. Transporter's Phone: (713) 930-4500

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID: 50089

H. Facility's Phone: (713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (Xylene, Toluene), Flammable Liquid, UN 1993, (D001) (D011) (D018) (D028) (D029) (F001) (F003) (F005)	006	DM	01958	P	(D001)(D011)(D018) (D028)(D029)(F001) (F003) (F005) 910100
x	b. RQ, Hazardous Waste Liquid, N.O.S., (Toluene, Methylene Chloride), ORM-E, NA 9189, (D006) (D007) (D011) (D018) (D028) (D029) (F001) (F005)	005	DM	01549	P	(D006)(D007)(D011) (D018)(D028)(D029) (F001) (F005) 910100
x	c. RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (D001) (F002) (F003)	001	DM	00433	P	D001, F002, F003, 916940
	d.					

J. Additional Descriptions for Materials Listed Above — Site: Page, AZ

11a, 11b, 11c. 55-gl steel drums
11a. ERG Guide #27 attached; 11b. ERG Guide No. 31 attached,
11c. ERG Guide #26 attached.

K. Handling Codes for Wastes Listed Above

T06

15. Special Handling Instructions and Additional Information — TELEPHONE NO. (602) 236- 5305 (FOR EMERGENCY RESPONSE)
11a, b. RES HO #42593-37 (Drum Nos. NGS 90-035, 91-002, 91-003, 91-006, 91-008)
11a. RES HO #42593-37 (Drum Nos. NGS 90-086, 91-004, 91-005, 91-007, 91-009, 91-010)
11c. RES HO #43151-37 (Drum No. 90-081)

16 GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Gordon DAVIS — Signature: Gordon Davis — Month Day Year: 01 09 91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials — Date

Printed/Typed Name: Joseph Paul Wilson — Signature: Joseph Paul Wilson — Month Day Year: 01 09 91

18. Transporter 2 Acknowledgement of Receipt of Materials — Date

Printed/Typed Name: Shirley Carroll — Signature: Shirley Carroll — Month Day Year: 01 17 91

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. — Date: 01 24 91

Printed/Typed Name — Signature — Month Day Year: 01 30 91

TWC-0311 (Rev. 01/01/89) White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: A Z D 0 7 4 4 5 2 4 2 6 | Manifest Document No.: 9 1 N 0 3

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

4. Generator's Phone (602) 645-8811

A. State Manifest Document Number: Nº 00248654

B. State Generator's ID: 99904

5. Transporter 1 Company Name: Chemical Disposal Company, Inc.

6. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID: 40158

D. Transporter's Phone: (602) 624-2348

7. Transporter 2 Company Name: Custom Environmental Transport

8. US EPA ID Number: D E D 9 8 0 9 1 8 8 5 8

E. State Transporter's ID: 40756

F. Transporter's Phone: (713) 930-4500

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number: T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID: 50089

H. Facility's Phone: (713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
X	a. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Methylene Chloride), Flammable Liquid, UN1993, (D018)(F001)(F003)(F005)	0 0 2	D M	0 0 7 8 7	P	D018, F001, F003, F005 910100
	b.					
	c.					
	d.					

GENERATOR

J. Additional Descriptions for Materials Listed Above
11a. 55-gl steel drums
ERG Guide #27 attached

K. Handling Codes for Wastes Listed Above
T06

15. Special Handling Instructions and Additional Information
Site: Page, AZ
11a. RES HO #42593-37 (Drum Nos. NGS 90-083 & NGS 90-084)

TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Mark Pierce	Mark Pierce	2	1	91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Kenneth Wyman	Kenneth Wyman	02	01	91

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Lynnette Weeks	Lynnette Weeks	02	09	91

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
		02	16	91

TWC-0311 (Rev. 01/01/89) White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. A Z D 0 7 4 4 5 2 4 2 6 | Manifest Document No. 91 NO 3

2. Page 1 of 2 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040

A. State Manifest Document Number
№ 00248662

B. State Generator's ID
99904

4. Generator's Phone (602) 645-8811

5. Transporter 1 Company Name
Chemical Disposal Company, Inc.

6. US EPA ID Number
A Z T 0 5 0 0 1 0 0 0 8

C. State Transporter's ID 40158

D. Transporter's Phone (602) 624-2348

7. Transporter 2 Company Name
Custom Environmental Transport

8. US EPA ID Number
D E D 9 8 0 9 1 8 8 5 8

E. State Transporter's ID 46756

F. Transporter's Phone (713) 936-4580

9. Designated Facility Name and Site Address
Rollins Environmental Services, Inc.
2027 Battleground Road
Deer Park, TX 77536

10. US EPA ID Number
T X D 0 5 5 1 4 1 3 7 8

G. State Facility's ID
50089

H. Facility's Phone
(713) 930-2300

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
x	a. RQ, Waste Flammable Liquid, N.O.S., (1,1,1-Trichloroethane, Toluene), Flammable Liquid, UN 1993, (D001)(F001)(F005)	0 0 1	D M	0 0 3 7 8	P	D001, F001, F005, 910100
x	b. RQ, Hazardous Waste Liquid, N.O.S., (Lead, Benzene), ORM-E, NA 9189, (D008)(D018)	0 0 5	D M	0 2 0 1 6	P	D008, D018, 942000
x	c. RQ, Hazardous Waste Liquid, N.O.S., (Benzene), ORM-E, NA 9189, (D018)	0 0 3	D F	0 0 4 2 8	P	D018, 942000
x	d. RQ, Hazardous Waste Liquid, N.O.S., (Benzene), ORM-E, NA 9189, (D018)	0 0 2	D M	0 0 2 8 7	P	D018, 942000

J. Additional Descriptions for Materials Listed Above
11a. 55-gl metal drum - ERG Guide No. 27 attached
11b. 55-gl metal drum - ERG Guide No. 31 attached
11c. 20-gl poly drum - ERG Guide No. 31 attached
11d. 16-gl metal drum - ERG Guide No. 31 attached

K. Handling Codes for Wastes Listed Above
AB 1.06
CD T02

15. Special Handling Instructions and Additional Information TELEPHONE NO. (602) 236-5305 (FOR EMERGENCY RESPONSE)
11a. RES HO #42593-37 (Drum No. NGS 91-013)
11b. RES HO #50340-36 (Drum Nos. NGS 91-018 thru NGS 91-022)
11c. RES HO #50339-24 (Drum Nos. NGS 91-023 thru NGS 91-025)
11d. RES HO #50339-25 (Drum Nos. NGS 91-026 & NGS 91-027

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Gordon M. DAVIS	Gordon M. Davis	03	08	91

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month	Day	Year
Russell Tres	Russell Tres	03	08	91

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month	Day	Year
SHIRLEY CARROLL	Shirley Carroll	03	10	91

TRANSPORTER

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
RES (TX) INC

Printed/Typed Name	Signature	Date: Month	Day	Year
C TREVIS	C Trevis	03	10	91

FACILITY

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator's US EPA ID No. AZD074452426	Manifest Document No. 91N05	22. Page 2 of 2	Information in the shaded areas is not required by Federal law.

23. Generator's Name
Salt River Project/Navajo Generating Station
P.O. Box W, Page, AZ 86040
Tel: (602) 645-8811

L. State Manifest Document Number: 00248662
M. State Generator's ID:

24. Transporter 1 Company Name: Chemical Disposal Company, Inc. — 25. US EPA ID Number: A Z T 0 5 0 0 1 0 0 0 8
N. State Transporter's ID: 40158
O. Transporter's Phone: (602) 624-2348

26. Transporter 2 Company Name: CUSTOM ENVIRONMENTAL TRANSPORT — 27. US EPA ID Number: DED980918858
P. State Transporter's ID: 40756
Q. Transporter's Phone: (913) 930-4500

	HM	28. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	29. Containers No.	Type	30. Total Quantity	31. Unit Wt/Vol	R. Waste No.
a.	x	RQ, Waste Paint Related Material, Flammable Liquid, NA 1263, (F003)	001	DM	325	P	F003, 916940
b.							
c.							
d.							
e.							
f.							
g.							
h.							
i.							

S. Additional Descriptions for Materials Listed Above
28a 55-gl metal drum - ERG Guide No. 26 attached

T. Handling Codes for Wastes Listed Above
T06

32. Special Handling Instructions and Additional Information
28a. RES HO #43151-37 (Drum No. NG591-039)

33. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: ~~Gordon M. Davis~~ Russell Tear — Signature: [signature] — Date: Month 03 Day 08 Year 91

34. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: SHIRLEY CARROLL — Signature: [signature] — Date: Month 03 Day 10 Year 91

35. Discrepancy Indication Space

EPA: Plant pollutes Grand Canyon

By William Booth
Washington Post

WASHINGTON — The Environmental Protection Agency on Tuesday fingered a government-supported power plant in Arizona as the main culprit behind the pollution that settles over the Grand Canyon every winter, obscuring the national park's rainbow of colors beneath a sooty haze.

The proposed finding could force the Navajo Generating Station, one of the largest coal-fired power plants in the country, to install "scrubbers" on its smokestacks or employ other technologies that would reduce its emissions of sulfur dioxide by as much as 90 percent. Cost estimates range from less than $300 million to more than $1 billion.

The proposed finding sets the stage for an interagency battle, since the power plant is partially supported by the Interior Department's Bureau of Reclamation, which maintains a quarter interest in the plant and uses the electricity to move water from the Colorado River to Phoenix, Tucson and farms in central Arizona. If the plant is required by the EPA to install scrubbers, the government probably would have to pay part of the cost.

To complicate matters, the Interior Department's National Park Service was responsible for conducting the study that indicted the Navajo plant as the main source of winter pollution in the Grand Canyon.

The Navajo plant, about 12 miles from the northern edge of the Grand Canyon in Page, Ariz., emits an estimated 12 to 13 tons of sulfur dioxide every hour, according to the EPA. The plant is the main contributor to haze in the winter, as emissions from the facility become trapped over the Grand Canyon, the study said. During the rest of the year, the park receives more pollution from Los Angeles and industries in other parts of Arizona and northern Mexico.

Studies conducted during the winter of 1987 by scientists with the National Park Service found that emissions from the power plant and sulfate readings in the Grand Canyon were closely related, said Molly Ross, assistant chief of air quality at the National Park Service. The service also noted that every time a plume of pollution passed over the Grand Canyon, sulfur readings went up. The research indicated that the Navajo plant contributes about 40 percent, on average, to the observed haze and as much as 70 percent during the worst episodes.

Interior Secretary Manuel Lujan on Tuesday requested that the National Academy of Sciences, an independent scientific organization, review all of the existing studies and determine how great a role the Navajo plant plays in winter haze over the Grand Canyon.

A spokesman for the Salt River Project, which manages the plant and is a part owner, called the park service study "inadequate" and "fundamentally flawed."

The decision by the EPA to fault the power plant was applauded by environmentalists, who have pressed the federal government to fulfill its statutory obligation to protect visibility at national parks.

The Environmental Defense Fund sued EPA in 1982 to force the government to impose controls on polluters of national parks. EPA has until February to recommend how much the Navajo plant needs to reduce its emissions.

EPA bid to kill dam stirs anger in Denver

By T.R. Reid
Washington Post

DENVER — The Bush administration gave environmentalists another major victory Tuesday — and infuriated Denver's business and political elite — with a formal proposal to veto construction of the Two Forks Dam, a giant water project that had enjoyed unswerving support from the Reagan administration.

The dam and reservoir, planned for the spot where two forks of the South Platte River meet about 30 miles southwest of Denver, would help to meet urban water needs along the front range of the Rockies well into the next century.

But it would flood much of Cheesman Canyon, a postcard-perfect stretch of forest that has been called "the St. Peter's Basilica of trout fishing."

The struggle over construction of Two Forks emerged earlier this year as one of the first major environmental decisions facing President Bush when he entered the White House. Last March, Bush's handpicked chief of the Environmental Protection Agency, William Reilly, announced his tentative decision to kill the dam.

That announcement sparked enormous political upheaval around Denver and led to a more detailed EPA review of the project. But the regional director of EPA's Denver office, James Scherer, generally considered a supporter of the dam project, was given no role in the review. Instead, the task was handed to Lee A. DeHihns, an official from EPA's Atlanta office.

Tuesday, DeHihns announced EPA's proposal to veto the dam, citing "the significant loss of aquatic and recreational values" along the trout stream and "the availability of less damaging practicable alternatives" to meet the Denver area's water needs.

DeHihns said the dam would "inundate a diverse riverine and upland habitat that contains one of the highest fish biomasses of trout in the western United States" — in other words, that the South Platte through Cheesman Canyon is cherished country for fishermen.

He also expressed concern about the dam's effect on water flow downstream, particularly in Nebraska, where whooping cranes and other birds nest along the Platte each spring.

There now will be two months of public comment and perhaps hearings on the veto recommendation before it becomes final. But supporters and foes of the dam plan saw the announcement as a near-fatal blow.

Denver Mayor Federico Pena joined a chorus of critics.

"This decision is a political statement ... that leaves us high and dry," the mayor said. "The people of Denver deserve and demand more than that."

Start acting like protector, U.S. water bureau urged

By Jim Mayer
Bee Staff Writer

Allies and adversaries alike testified Tuesday that the U.S. Bureau of Reclamation's new mission as steward of water resources must mature beyond rhetoric and press releases to restore fisheries, wildlife and water quality.

The testimony was before a U.S. Senate subcommittee that met in Sacramento to examine the bureau's schizophrenic legacy as foster parent of Central Valley agriculture and culprit of broad environmental damage.

The bureau itself over the last two years has declared that its purpose had shifted from building dams to better managing water projects so that growing needs could be met in a way that is compatible with the natural waterscape.

"The question before this subcommittee is the bureau's role in balancing environmental protection and economic activity," said Sen. Bill Bradley, D-New Jersey, chairman of the Water and Power subcommittee of the Senate Energy and Natural Resources Committee.

Bradley said he realized the bureau was largely responsible for the Central Valley's world renowned agricultural production. But what brought the subcommittee to California, Bradley said, was the "heavy burden" water development has placed on fish and wildlife.

The testimony echoed the realization. The same bureau that built dams, controlled floods and irrigated the desert was blasted for selling cheap water to corporate farms, deforming ducks with farm drainage and killing salmon by depriving rivers of fresh water.

"The costs and benefits of federal water exploitation programs in California do not fall evenly across all people," said Nat Bingham, president of the Pacific Coast Federation of Fishermen's Associations.

STATE NEWS

As water projects have diminished the salmon fisheries, Bingham said, federal regulators have increased restrictions on ocean trollers such as himself. This year's catch has been especially small, Bingham said, and he places "the lion's share" of responsibility on federal dams.

"Many of these fishermen will be unable to make their boat mortgages, their home mortgages this year," Bingham testified. "These are hard working small businessmen. They take risks daily to bring to market a product that is nutritious, enjoys worldwide demand, that needs no federal subsidy."

Hal Candee, an attorney for the Natural Resources Defense Council, chided the bureau for approving a trust plan put together by J. G. Boswell Co., one of the largest cotton operations in the world, so it could avoid a 960-acre limit on federally subsidized water.

Candee said the subsidized water distributed throughout the valley has discouraged conservation, and he denounced the bureau's refusal to study conservation alternatives before renewing 40-year water contracts with valley growers.

The bureau was not invited to testify before the subcommittee.

But others testified that California's entire water industry — not just the bureau — was at the advent of a new era of ecological awareness, and of compromises instead of conflicts, negotiations instead of lawsuits.

David Kennedy, director of the state Department of Water Resources, said the bureau's attitude toward the environment had changed. But the agency, trimmed down during the Carter and Reagan administrations, now lacked the staff to carry out the new mission touted in press releases.

Peter Bontadelli, director of the state Department of Fish and Game, said it was time to stop castigating the bureau.

"I think it is appropriate to recognize that society as a whole was responsible for those past policies and society now is demanding a change," Bontadelli said. "I think it is appropriate to stop assessing blame and concentrate on what we all need to do to restore fish and wildlife."

Whether it is modifying Shasta Dam to release cold water for salmon, or cleaning up toxic drainage from San Joaquin Valley farms, the subcommittee was told even the most cooperative efforts boil down to who pays.

Rep. Vic Fazio, D-West Sacramento, who sat in on the hearing, said neither all the blame nor all the bills can be laid on the bureau.

"In reality the bureau was carrying out what Californians came to Washington and lobbied for," Fazio said. "No one is going to be free from financial responsibility."

Lingering behind the bureau's new mission is one additional authorized dam — Auburn. Kennedy said that the state doesn't want to finish the partially built dam, but urged the debate be resolved this winter.

Kennedy said some kind of Auburn Dam is essential to protect the capital from a catastrophic flood.

"The need for flood control is so significant we can't afford to delay much longer," Kennedy said.

United States
Environmental Protec
Agency

Regional Administrator
75 Hawthorne Street
San Francisco, CA 94105

Region 9
Arizona, California
Hawaii, Nevada
Pacific Islands

EPA Environmental News

FOR IMMEDIATE RELEASE: Monday, January 7, 1991

Contact: Al Zemsky, U.S. EPA
(415) 744-1589

SALT RIVER'S NAVAJO GENERATING STATION WILL ADDRESS WASTE VIOLATIONS

(San Francisco)--The U.S. Environmental Protection Agency (EPA) today announced the signing of a consent agreement and final order with the Salt River Project, which will correct hazardous waste violations at the Navajo Generating Station (NGS), on the Navajo Nation near Page, Ariz.

In addition, the Salt River Project will pay federal penalties of $113,500.

"By signing this agreement, the Salt River Project demonstrates its commitment to planning for the proper handling of any hazardous wastes at the Navajo Generating Station," said Jeff Zelikson, director of hazardous waste management for EPA's western regional office.

The Salt River Project has also agreed to conduct sampling and analysis of soils and groundwater at the site, to detect any contamination which may have resulted from the use of chromium in the facility's bearing-cooling water system.

This agreement resulted from a complaint issued by EPA on Nov. 22, 1989, which charged the facility with potential violations of the federal Resource Conservation and Recovery Act.

NGS is a coal-fired electric generating station in operation since 1974. The facility includes three 75,000 kilowatt steam electric generating units. The Salt River Project, a public utility associated with the federal Bureau of Reclamation and the state of Arizona, generates and distributes electricity and provides water for irrigation and residential use.

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